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COMMERCIAL FISHERIES REVIEW

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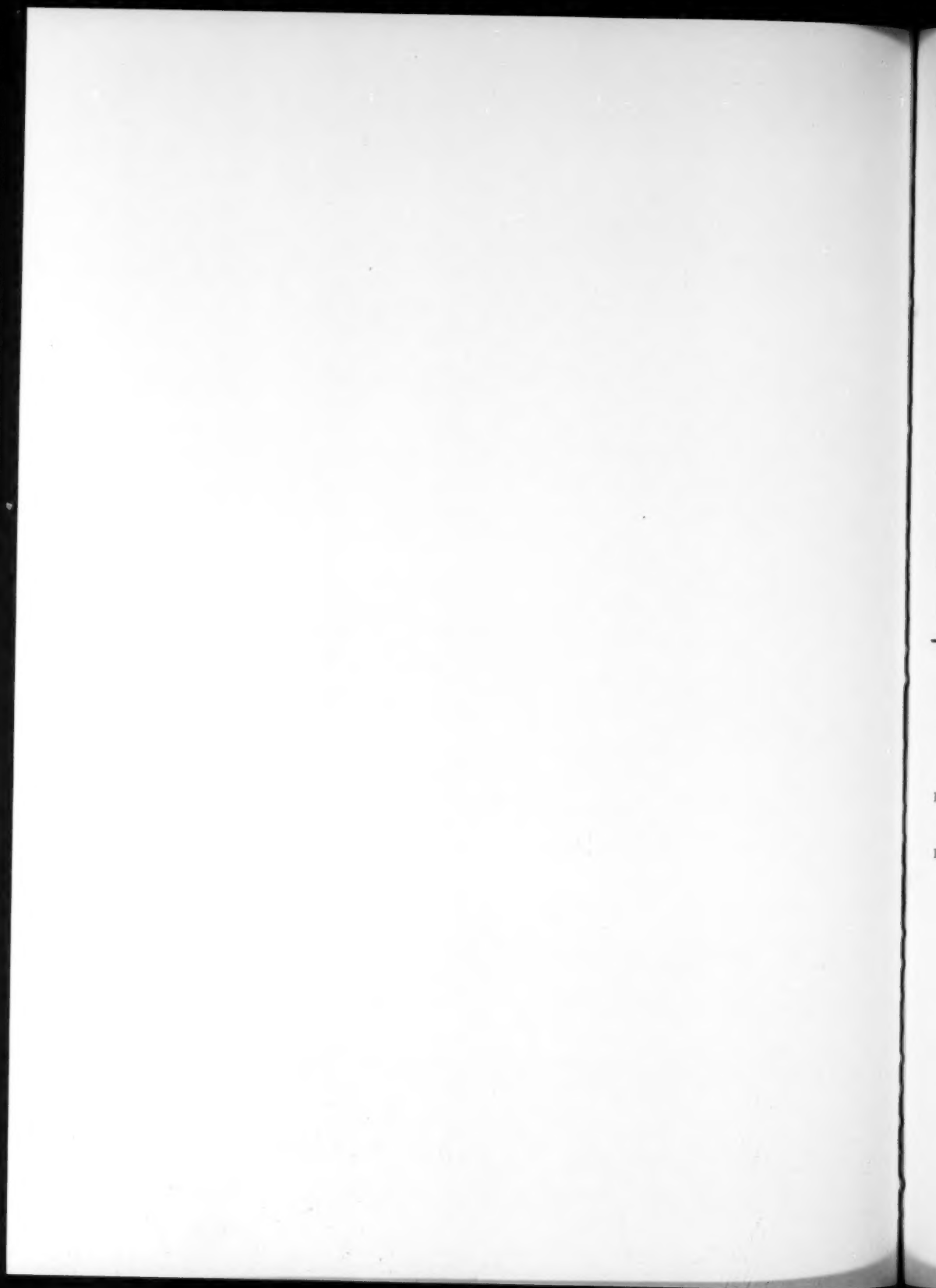
1965



VOL. 27, NO. 4

APRIL 1965

UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Commercial Fisheries
Washington, D.C.



UNITED STATES
DEPARTMENT OF THE INTERIOR

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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 1, 1963.

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Price 60 cents (single copy). Subscription Price: \$6.50 a year; \$2 additional for foreign mailing.

COMMERCIAL FISHERIES REVIEW

April 1965

Washington, D.C.

Vol. 27, No. 4

EXPLORATORY FISHING FOR SPINY LOBSTERS, SAND LOBSTERS, AND SCALLOPS IN PANAMA

By Norman L. Pease*

SUMMARY

An interagency agreement between the U. S. Bureau of Commercial Fisheries and the Agency for International Development provided for a survey of the spiny lobster potential on both coasts of the Republic of Panama. This was conducted for an 18-month period with the chartered vessel Pelican, and staffed from the Bureau's Exploratory Fishing and Gear Research Base at Pascagoula, Miss.

Lobster traps were selected for use during the exploratory phase owing to their versatility, which enabled several scattered areas to be worked simultaneously. Three types of traps were used: wire, wood, and reed. Wood traps were the most successful, and were better able to withstand the rough handling experienced during fishing operations. Up to 200 traps a day could be hauled and reset during exploratory work. A variety of locally caught bait was used without any strong preference being indicated by the catch results. Decomposed bait and puffers did not prove effective.

Exploratory fishing revealed three areas with good commercial lobster fishing potential: 1 Caribbean area, Bocas del Toro; and 2 Pacific areas, Gulf of Panama and Gulf of Chiriqui coast. Commercial amounts of two species of spring lobsters and one species of sand lobster were caught in those areas. The sand lobster could be caught only by trawling.

The male Pacific spiny lobster was found to be predominant in the trap catch while the female lobster was predominant in the trawl catch. Data from the catch of the female Pacific spiny lobster revealed that gravid females were more abundant in the trawl catch than the nongravid, whereas in the traps, the ratio of gravid females was slightly less than the non-gravid. The trawling was done offshore and probably influenced the catch ratio because the spawning females seek areas with favorable offshore flowing currents to disperse the larvae.

A bay scallop with commercial potential was found in the Gulf of Panama. Within 2 months, over 400 people afloat and ashore were employed catching and processing scallops.

*Fishery Biologist (General), Exploratory Fishing and Gear Research Base, U.S. Bureau of Commercial Fisheries, Pascagoula, Miss.



Fig. 1 - R/V Pelican approaching a flag buoy which marks a lobster trap location.

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 730

INTRODUCTION

In 1961, local fishermen were exploring with modern techniques and equipment only two of the natural marine resources of the Republic of Panama. These were shrimp and sardine-like fish. Most food fish consumed within Panama was still being taken with hand lines; a small number were taken incidental to the shrimp fishery; and there was some beach seining. For many years an important pearl oyster and pearl-oyster shell fishery flourished along the Pacific coast. That fishery started declining after 1925 (Galtsoff 1948); it has now been defunct for more than 25 years. Approximately 25 percent of the 886 miles of the Pacific coastline of Panama was being used in established fisheries. The 489 miles of its Caribbean coastline were almost completely undeveloped. Only a small amount of food fish was caught (for personal consumption) along that sparsely settled coast. Several years ago a fishing cooperative was established at a small coastal community in the Gulf of Panama. That cooperative is attempting to introduce new fishing methods and fish-handling techniques.

It was with this background that the U. S. Agency for International Development (AID) requested the U. S. Bureau of Commercial Fisheries to study the feasibility of developing new fisheries in Panama. The resultant report indicated possibilities that two resources, sharks and spiny lobsters, might be developed.^{1/} One recommendation in the report was that an exploratory fishing survey be made to determine the spiny lobster resources of the Caribbean and Pacific coasts of Panama. That suggestion was approved, and the Bureau and AID negotiated an interagency agreement for the survey. The initial agreement was extended so that the entire survey was conducted for an 18-month period from July 1962 to December 1963. The responsibility for the survey was assigned to the U. S. Bureau of Commercial Fisheries Exploratory Fishing and Gear Research staff located in Pascagoula, Miss.

VESSEL AND EQUIPMENT

A 72-foot, steel-hulled shrimp trawler, Pelican, was chartered by the Bureau for use during the survey (fig. 1). Some modifications were made to the vessel, and some additional equipment was installed--a flying bridge equipped with steering and engine controls, new davits on the stern for carrying a skiff, and air conditioning units for the living quarters. A hydraulically-operated boom and power block were installed amidships at the port rail for use as a trap hauler. Additional electronic equipment was installed as follows: radar, loran, single-side band and citizen-band radio transmitter-receivers, radio direction finder, and two depth-recorders. The fuel and fresh-water capacity was for a range of 2,500 miles. Accommodations were provided for 5 staff members or cooperators and a permanent vessel crew of 5.

A 17-foot outboard-powered skiff was carried for working traps in shallow-water areas (fig. 2). Equipped with a depth-sounder, which recorded in feet, the skiff was capable of carrying 3 men and between 15-25 traps in areas not navigable by the Pelican.

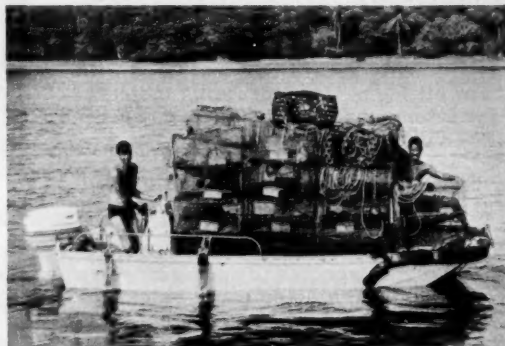


Fig. 2 - The 17-foot fiberglass skiff loaded with wire and reed lobster traps.

FISHING GEAR

Lobster traps were selected as the primary fishing gear for the survey. This was because of their demonstrated proficiency in successful lobster operations throughout the world and because of their adaptability to either a large- or small-scale fishing operation. The traps used were constructed of three different materials--reed, wire, and wood.

^{1/}A program for the More Effective Use of Panama's Fishery Resources, FIO/T 525-29-060-10037, Washington, D.C., June 30, 1961 (mimeographed report from the Bureau of Commercial Fisheries to the U.S. Agency for International Development).

REED TRAPS: The woven reed traps used were acquired in Nicaragua. They were similar in design to those used in other tropical areas (fig. 3). Efforts to replenish the supply of that type trap became difficult, owing to a limited amount of reed in Nicaragua and the lack of shipping facilities. The traps were 14 inches high and 32 by 36 inches wide with a single funnel opening on one side. A 15-pound cement block was wired to the bottom of the trap to keep the trap upright on the ocean floor.

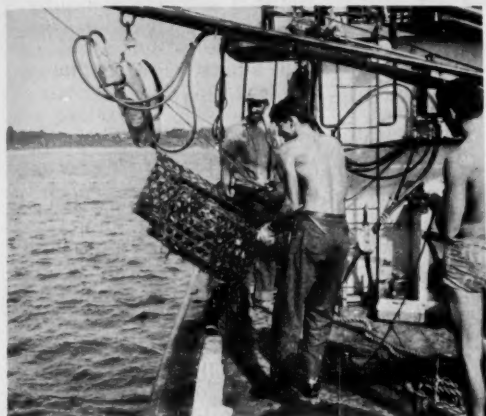


Fig. 3 - A reed trap being hauled aboard the Pelican. The side funnel shows at left.

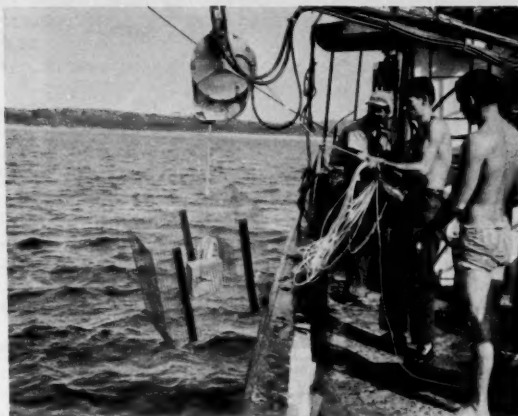


Fig. 4 - A wire lobster trap being hauled aboard the Pelican. The hydraulic block and its connections are visible.

WIRE TRAPS: Wire traps were made locally from either $\frac{3}{4}$ - or 1-inch hardware cloth and measured 36 x 36 x 14 inches (fig. 4). Various funnel arrangements were tried; both side and top funnels were used as were multiple funnels. Each trap had a cement block wired to its bottom.

WOOD-SLAT TRAPS: Wood traps were constructed of 1- by 2-inch slats and measured 2 by 3 feet at the base (fig. 5). The sides sloped-in approximately 2 inches from bottom to top. Each trap was 18 inches deep and had an 8-inch square funnel on the top that extended 6 inches into the trap. For weight, 1 inch of cement was poured into partitions on each end of the trap.

FLAG BUOYS AND LINES: Flag buoys were used to mark the location of one trap or a multiple set of traps (fig. 6). They were made using a 40-inch wood pole which had 3 square inches of cement at the base. Two to three 6-inch squares of 2-inch styrofoam were secured slightly below the middle of the pole, and a flag was attached to the top. The use of fluorescent orange paint on either the pole or the flag assisted in locating it. A 2-fathom length of line, with an additional styrofoam float at its end, was secured to the buoy; this provided a target area for the retrieving grapnel. A $\frac{5}{16}$ -inch manila or sisal buoy line was secured from the 2-fathom float line to the trap. The lengths of the buoy lines were adjusted according to the depth of the water; however, 15-fathom lengths were most frequently used.

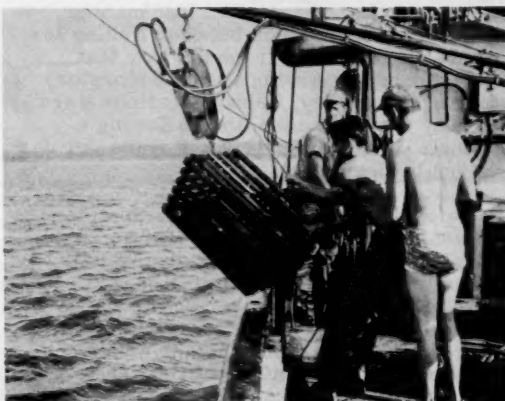


Fig. 5 - A wood-slat lobster trap being hauled aboard the Pelican, with the top funnel showing.



Fig. 6 - A basket of Pacific spiny lobsters, *Panulirus gracilis*. Flag buoys and wood-slat lobster traps are in the background.

ography, currents, and other environmental conditions determined after on-the-scene observations. Another factor considered was the proximity to coastal towns and fishing communities.

When the fishing location had been determined, buoy lines were tied to the traps, which had been baited and stacked in units of two on deck. The vessel then traveled a predetermined course at a reduced speed, and the traps were set. A flag was first thrown into the water. When all the buoy line had been payed out, the trap was dropped. This was followed immediately by the next buoy, and the process was repeated until all the traps had been set. Sometimes, multiple sets were made. Main buoy lines from 2 or 3 traps were connected in sequence, and a flag buoy was used only on the first trap. This technique reduced hauling time, but occasionally many traps were lost when buoy lines parted.

Traps were retrieved by using a grapnel to hook the 2-fathom float line and pulling in enough buoy line slack to reach the block of the hydraulic trap hauler. The trap was then hauled aboard over the hauler, the lobsters were removed, and traps were rebaited and stacked for resetting (fig. 7). About 50 traps at a location were handled in that manner. The greater the distance between fishing locations, the fewer the traps per day that could be handled. Owing to the exploratory nature of the survey, fishing locations were generally widely spaced, thus allowing a maximum of approximately 200 traps per day to be hauled and reset.

Bait was taken by trawling with a standard 40-foot semiballoon trawl (Bullis 1951), by trolling, by long-lining for sharks with 10-hook units of Japanese long-line gear (Captiva 1955), and by hand-lining during the day or by night with lights for attraction. Experiments were made to determine whether or not lobsters showed any significant preference for any of a variety of locally-caught bait. Among the species of fish used were black skipjack, several species of sharks, jacks, anchovetas, and species of bottomfish such as snapper, croaker, majarra, goatfish, threadfin, and others. Large fish were cut into 6-inch strips, and small fish were used whole. Several fish, or pieces of fish, were strung on soft baling wire and secured to the bottom of the trap where it would be impossible for a lobster to reach them from the outside. All the species used were

LOBSTER TRAWL: A 40-foot, 4-seam shrimp trawl made from 2-inch synthetic webbing, which had been used for catching bait, was slightly modified for lobster fishing. Twenty-two 9-inch rollers were strung on a $\frac{1}{4}$ -inch nylon line, which was seized to the foot-rope between each roller. A $\frac{1}{4}$ -inch tickler chain, connected to the lower rear bracket of each door, was adjusted to scrape the bottom just ahead of the trawl.

FISHING METHODS

Several factors determined which areas were to be explored. Initially, the coastal and island areas were separated into geographic zones that could be conveniently covered during a single cruise. Locations within those zones were further delineated by bottom top-



Fig. 7 - Removing a spiny lobster from a reed lobster trap.

found to work with equal efficiency as long as they were fresh. Putrefied bait appeared to be less attractive. Fish with spines or other sharp protuberances were not used for personal safety reasons.

Only one species of fish, a puffer (*Spaeroides annulatus*) was found to be unsuccessful as lobster bait. When that fish was used as bait, it would not attract lobsters; when it was mixed with other species, it would be ignored, but the other fish would readily be consumed. Halstead and Russell (1956) report two toxic substances isolated from a puffer found in Japanese waters, which when ingested by humans can cause illness within 30 minutes and coma and possible death within 1-24 hours.

FISHING RESULTS

LOBSTER AREAS: During exploratory fishing, three areas of potential lobster production were located, 1 on the Caribbean coast and 2 on the Pacific. Each area, in addition to having extensive reef or rocky bottom conditions, which could sustain large lobster populations, was also close to population centers with established transportation systems. The Bocas del Toro area was explored on the Caribbean coast; Chiriqui Gulf and the northwestern section of the Gulf of Panama (fig. 8) were explored on the Pacific coast. Although lobsters were found in other explored areas, a reduced amount of favorable bottom or the remoteness of the other areas from any community forestalled further immediate interest.

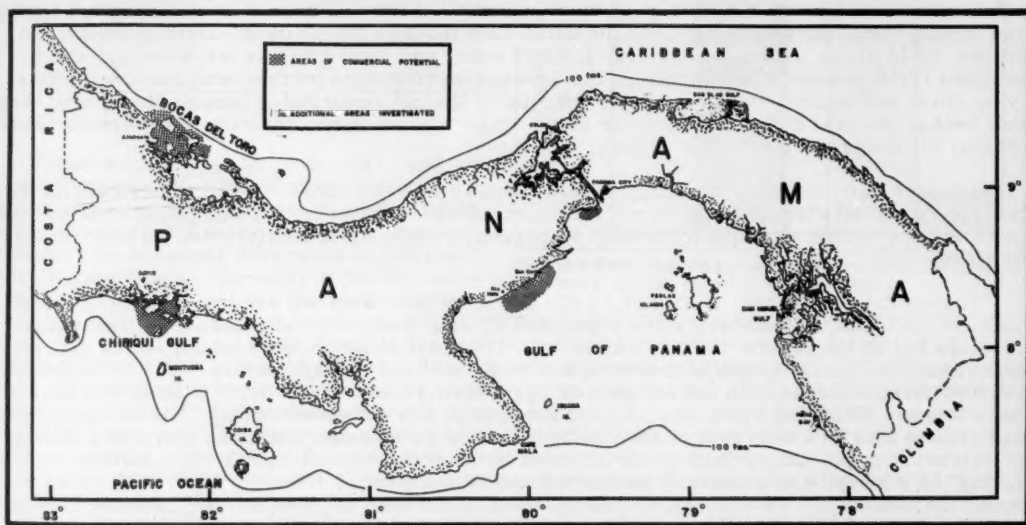


Fig. 8 - Chart of Panamanian waters with areas of commercial lobstering potential and all other areas investigated indicated.

EFFECTIVENESS OF TRAPS: A comparison of the catch per unit of effort indicated that in the order of effectiveness of the three types of traps used, wood was most successful, followed by reed, then wire. The wood traps had a 48-percent catch per unit of effort, the reed 27 percent, and the wire 25 percent. The reed traps, and the wire to a slightly less degree, were also found to be susceptible to shark damage.

Experiments to determine the optimum number of days between hauling traps indicated that maximum catches were made from those traps which were fished for 2 to 3 days. It was found that after 3 days, the bait had generally been consumed or else it had become badly decomposed and was less effective. From 4 days on, after the bait had been entirely consumed, it was not uncommon to find that 1 or 2 of the lobsters had been devoured by the rest of the lobsters still in the trap.

LOBSTER SPECIES: Three species of lobsters were found in commercial quantities during the survey. In the Bocas del Toro area, the Caribbean spiny lobster, *Panulirus argus*, was caught by traps in depths up to 10 fathoms. On the Pacific side, in the Chiriqui Gulf, a Pacific spiny lobster, *P. gracilis*, was caught by traps within the same depth range. In the Gulf of Panama, *P. gracilis* was caught by both traps and by trawls, and a Pacific sand lobster, *Evibacus princeps*, was caught with trawls (fig. 9). Trapping of lobsters was generally carried out between 50 yards and 1 mile from land or exposed rock formations, whereas the trawling was conducted between 2 and 5 miles from shore.

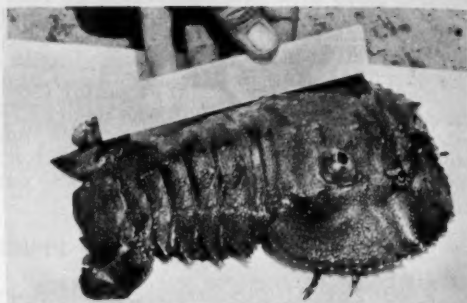


Fig. 9 - A Pacific sand lobster, *Evibacus princeps*. This specimen can be identified as a female by the divided tip of the 5th leg visible in photograph.

SIMULATED COMMERCIAL FISHING: Two simulated commercial fishing cruises were conducted in the Gulf of Panama. During the first of those cruises, wood traps were used for 22 days of fishing, and 1,066 spiny lobsters weighing 1,458 pounds were caught. A total of 200 traps had been set. Each day 100 of those were hauled, rebaited, and reset. The daily catch rate varied from 20 to 109 pounds of lobsters. A combination of new, unseasoned traps and strong winds adversely affected the catch rate for 9 of the 22 days. During the second cruise, in 45 drags with a lobster trawl, 2,847 spiny and sand lobsters were caught which weighed 2,758 pounds. The bottom in the 14-square-mile area worked was hard, with low-lying coral and rocks. Only one major tear-up of the net occurred, although the tickler chain was broken several times. Except for those drags that were shortened by tear-ups or broken chains, all drags were 90 minutes long.

Lobster catches from the drags varied from 10 to 210 pounds. Relative numbers of the two species of lobsters taken also varied among drags. However, the composition of the total catch for the cruise was approximately 60 percent Pacific sand lobsters and 40 percent spiny lobsters.

LOBSTER SPAWNING AND RELATED MIGRATION: With the exception of a portion of the trawl catches, all lobsters were separated by sex, weighed, and measured. The sexual development of the female lobster was noted. The total weight was recorded to the nearest ounce, and the dorsal length of the carapace was recorded in millimeters. The term gravid, as used here, includes both the berried or egg-bearing lobster and those with sperm sacs on their thorax. This definition was adopted because it was observed during field examinations that female lobsters with sperm sacs were in a ripe or ripening condition and would shortly be releasing eggs. Only adults were included in the nongravid category. The inshore fishing, during the survey, was primarily between 5 and 10 fathoms or from 50 yards to 1 mile from land. Because of the extensive Continental Shelf in the Gulf of Panama, the offshore fishing was also in the 5- to 10-fathom depth range, but the distance from the nearest land varied between 2 and 5 miles.

To derive useful information on spawning required collections for a full 12-month period. This was accomplished for the Pacific spiny lobster, *P. gracilis*. Owing to adverse weather conditions and the geographical distances involved, an insufficient amount of spawning data was collected for the Caribbean species of spiny lobster, *P. argus*. The Pacific sand lobster was not located in commercial quantities until just prior to the end of the project; this precluded any opportunity to collect the necessary seasonal information. An indication that additional species of lobsters might be available was revealed by the capture of one specimen of the Caribbean sand lobster, *Scyllarides aequinoctialis*, in 8 fathoms off the northwest coast of Panama.

A total of 877 Pacific spiny lobsters, *P. gracilis*, were examined from the catches of simulated commercial trap fishing in the Gulf of Panama. The sex ratio of this catch was 542

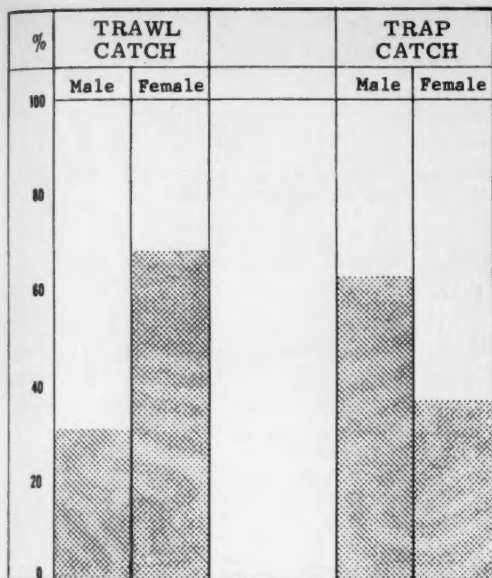


Fig. 10 - Graph showing the inverse sex ratio between the trawl and trap-caught Pacific spiny lobster, *P. gracilis*.

Traps were fished in September, and the trawling was carried out during December. Because the depth, temperature, and salinity of the waters fished were similar in both instances, this seasonal difference is not considered significant. The only apparent variable that might account for the differences in sex ratio was that the trawls were operated from 2 to 5 miles offshore whereas trapping was done from 50 yards to 1 mile from either land or exposed rock formation. A total of 861 female lobsters that had been caught in inshore waters were examined (fig. 11). Of those, 405 or 47 percent were gravid and 456 or 53 percent were nongravid. Also, 204 female lobsters caught by trawls in offshore waters were examined. Six of those were juveniles and were not used in the data. Of the remaining 198, 183 or 92 percent were gravid and 15 or 8 percent were nongravid. The gravid females, which were found offshore, were probably attracted there by the favorable offshore-flowing currents which provide maximum dispersal of their larvae. Fleming (1938) states that there is a counter-clockwise circular movement of water within the Gulf of Panama which has a velocity of approximately 0.5 knot. The spiny lobster larvae are reported by Thorson (1961) to have a pelagic life of 150 to 180 days.

PANAMA BAY SCALLOPS, A NEW MARINE RESOURCE: During routine bait trawling in the Gulf of Panama, 4 bushels of scallops, *Aequipecten circularis*, were captured. Their meat yield and quality were checked and found to be excellent. This information was passed on to the local shrimp trawling fleet, which dispatched four vessels to the area. Using only bottom trawls, they soon caught 23,000 pounds (whole scallops). One of the local shrimp plants made some rapid renovations that made a 24-hour continuous operation possible. More than 300 people were employed to process, pack, and freeze scallop meats. Within a short time, there were 15 trawlers, with crews averaging 6 men, working the beds. A change of gear from trawls to 6-foot reinforced expanded metal dredges enabled the vessels to double their production rate (fig. 12). During the first 2 months of operation, 658,161 pounds^{2/} of shell stock (whole scallops) were produced.

^{2/}Personal communication from Juan L. Obarrio, Director, Department of Fishes, Panama.

(62 percent) males to 335 (38 percent) females. From the catches of trawls in the Gulf of Panama, 302 lobsters were examined. Their sex ratio was 98 (32 percent) males and 204 (68 percent) females (fig. 10).

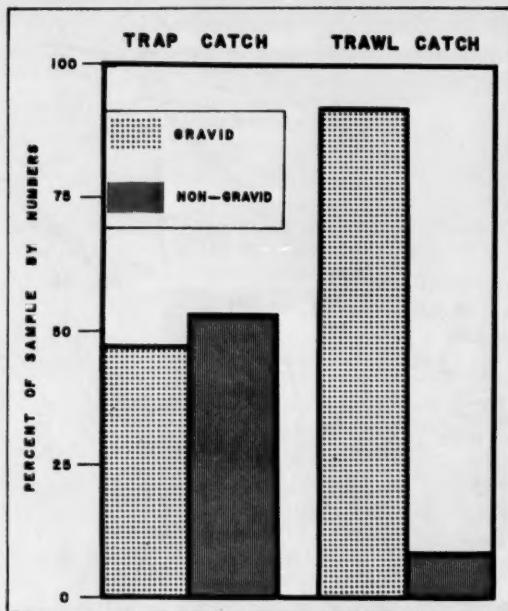


Fig. 11 - Ratio of gravid and non-gravid female Pacific spiny lobsters, *P. gracilis*, caught by traps and trawls.

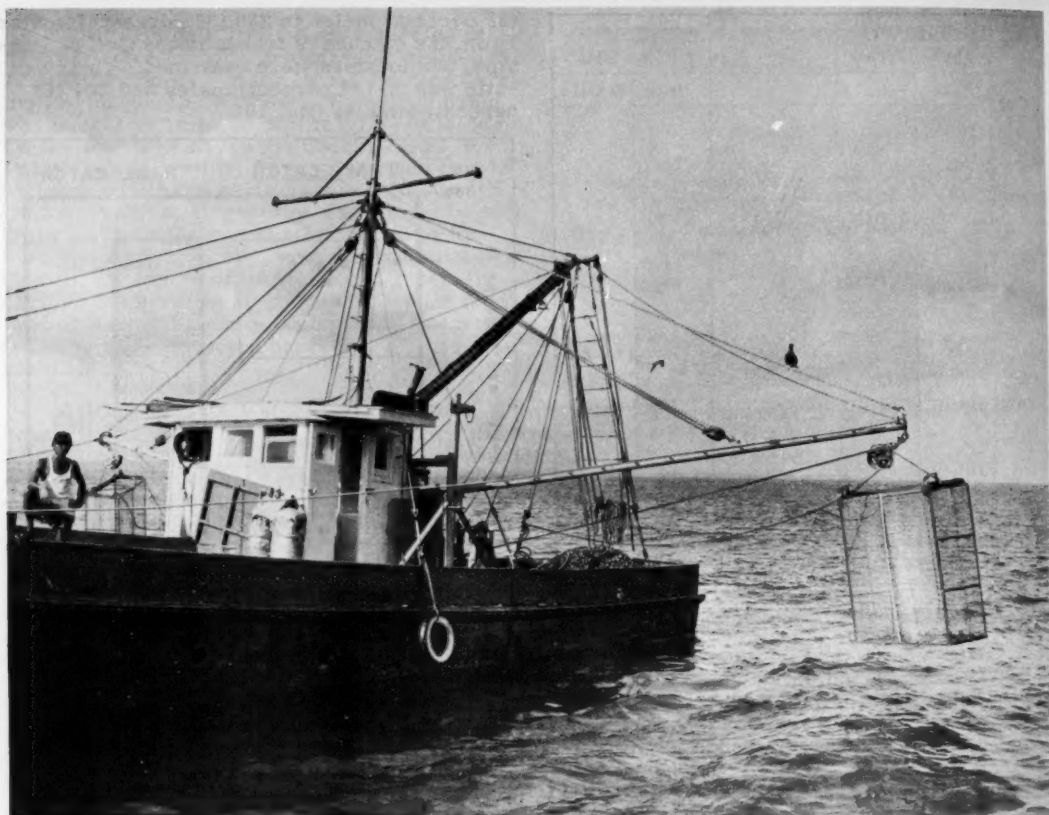


Fig. 12 - A Panamanian dragger double-rigged with a locally constructed scallop dredge. A deck load of Panama Bay scallops, Aequipecten circularis, can be seen.

Three private lobster trapping operations were in various stages of development at the end of the project. Two had boats in the 30- to 40-foot length range being modified and the third, using small craft to handle his traps, had constructed a lobster-holding pound.

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ON-THE-JOB TRAINING PROGRAM FOR TRAINEE COMMERCIAL FISHERMEN

By John J. Murray*

ABSTRACT

Under the provisions of the Manpower Development and Training Act, an on-the-job training program has provided commercial fishing training for 24 unemployed men.

The training program plus the cooperation between Federal, State, and municipal agencies have assured the success of the project, employed 24 men, and provided the Gloucester, Mass., fishing fleet with new workers in a tight labor market.

INTRODUCTION

Successful completion of an on-the-job training program under the Manpower Development and Training Act has made available 24 trainees skilled in the fundamentals of otter-trawl fishing as prospective fishermen for the trawlers of Gloucester, Mass.

Directed by the U. S. Department of Labor's Bureau of Apprenticeship and Training, the program provided vocational on-the-job training in the skills required by commercial fishermen aboard vessels of the North Atlantic fishing fleet. Development of the project was co-sponsored by the Gloucester Fishing Vessel Owners Association and the Atlantic Fishermen's Union (AFL-CIO). Federal, State, and municipal agencies directly concerned with the program included the U. S. Bureau of Commercial Fisheries, Massachusetts Division of Employment Security, and the Gloucester Vocational School.

Under the provisions of the Manpower Development and Training Act, the Federal government bore all costs of the training program, including the subsistence and transportation allowances of the trainees. Additional project costs included salaries for two instructors, procurement of supplies and materials for net-loft training, procurement and supply to each trainee of personal and foul-weather gear for use on shipboard, and premium costs for liability insurance in Protection and Indemnity coverage for all trainees. Personal and foul-weather gear included rubber boots, oilskins, oil hat, work gloves, and mattress. Trainees were required to supply their own work clothes and blankets.



Fig. 1 - Medium fishing vessel operating as a scallop dredger or otter trawler from New England fishing ports.

SELECTION OF TRAINEES

The applicants were first screened by the Massachusetts Division of Employment Security. To qualify for the training, applicants had to be either unemployed or underemployed (working less than 40 hours weekly), head of a family or household, strong and in good health, and

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U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 731

willing to work at sea on board fishing vessels during most of the training period. The trainees had been laborers, welders, painters, shipping clerks, machine operators, and electrician's helpers. Although desirable, previous fishing or maritime experience was not required of the applicants, and only 5 of the 34 men selected for the course had previous experience either on fishing boats or merchant ships.

The program began August 3, 1964, with a class of 34 trainees and ended November 20, 1964, with a total of 24 persons completing the full course of instruction.

Average age of the group was 33 years--considerably lower than the average age of the commercial fishermen operating in the otter-trawl fishery out of the port of Gloucester and Boston, Mass. (table).

Classification of Commercial Fishing Trainees by Age Groups	
Years	Number
Under 25	5
From 25 to 29	4
" 30 to 34	8
" 35 to 39	2
" 40 to 44	3
" 45 and over	2

COURSE OF INSTRUCTION

The training period was 16 weeks--13 weeks of on-the-job training at sea on board fishing trawlers and 3 weeks of supplemental training ashore under the guidance of instructors skilled in the arts of fish-net assembly and repair, and in the splicing of wire and rope. The shoreside training was scheduled for a 2-week period prior to sea duty, plus a week of instruction in the net loft during the final period of the course.



Fig. 2 - Group of trainees at wharf during instruction in fishing vessel safety.

During the first week of the training, under the direction of the Fishing Vessel Safety Unit of the U. S. Bureau of Commercial Fisheries, the trainees were given an intensive course in the basic principles of fishing vessel safety. Safety instruction included inspection of selected fishing vessels, explanation of the use and function of fishing gear employed aboard otter trawlers, general briefing on safe operating practices, and enumeration of unsafe conditions and hazards apt to be encountered on shipboard during their tour of sea duty.

SHORE TRAINING: Shore training included over 100 hours of instruction in handling fish nets, wires, ropes, and accessory fishing gear used in the otter-trawl fishery. Emphasis was devoted to the fundamentals of trawl assembly, rigging of floats, rollers, and accessories for otter-trawl nets, and the splicing of wire and rope. Additional phases of the instruction covered such operations as serving and parceling wire rope, marking maintrawling wires, and tying simple knots widely used on board fishing vessels.

SEA TRAINING: Most of the training program was carried out at sea on board Gloucester trawlers working under actual fishing conditions. Forty-nine fishing vessel owners and captains participated in the program and made their vessels available to carry and instruct the trainees under on-the-job conditions.

The trainees were not classed as regular crew members but rather as supernumeraries,

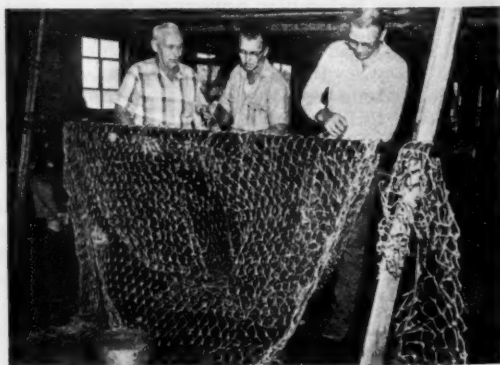


Fig. 3 - Instructor counsels trainees in the art of fish net repair.

assisting the crew in all possible ways while obtaining experience and skill in the duties of otter-trawl fishermen.

The trips varied from 4 to 20 days depending on the fishery, the availability of fish, and weather encountered. Boats operating in the fisheries for whiting and groundfish on in-shore fishing grounds made short trips of 2 to 8 days. Vessels in the ocean perch fishery, working fishing areas 300 to 600 miles from Gloucester, averaged 12 days per trip. The program instructors scheduled training trips so that the trainees would serve on vessels in the whiting, groundfish, and ocean perch fisheries.

While the progress of the trainees in acquiring fishing skills depended in great part on the individual's initiative and capability, shipboard instruction was generally directed towards:

1. Quartermaster duties--standing regular wheel and lookout watch with crew members while the vessel was traveling to and from the fishing grounds.
2. Rigging otter-trawl nets and accessory fishing gear prior to setting the nets.
3. Setting and hauling otter-trawl nets.
4. Culling, dressing, and washing fish catches.
5. Icing fish catches in vessel's hold.
6. Unloading fish catches and preparing fish hold for next trip.
7. Servicing fish nets and gear in preparation for next trip.

BENEFITS OF THE PROGRAM

The combination of shoreside instruction in fishing skills and experience at sea on-the-job has added 24 trained men capable of handling the arduous duties of fishermen on board fishing trawlers in the North Atlantic waters. The program, at a cost to the Federal Government of less than \$800 per trainee, has removed men from the ranks of the unemployed, qualified them for employment in a trade where the fishermen have averaged earnings of from \$6,000 to \$6,500 per year, and provided new recruits for an industry plagued by an extreme shortage of competent workers.

Indoctrination of the trainees in the fundamentals of fishing vessel safety was the first time that safety instruction was included in a training project of the Manpower and Development Training Act. The immediate purpose of the instruction was to minimize the possibility of personal injury by pointing out the hazards associated with commercial fishing operations and creating a positive attitude towards accident prevention on the part of trainees. The accident-free work record of the trainees established during the training period indicates the value of the safety instruction.



Fig. 4 - Trainees practice their skill in mending fish nets.



TRENDS AND DEVELOPMENTS

Alaska

FOREIGN FISHING ACTIVITY OFF ALASKA, JANUARY 1965:

U.S.S.R.: The Soviet trawling fleet which had been operating in the general vicinity of Yakutat consisted of about the same number of vessels through January 1965 as in the previous month of December 1964. Some 15 vessels made up that fleet. It was the first time the Soviets have maintained fishing operations during the winter months in the Gulf of Alaska.



Fig. 1 - Soviet salvage tug in Bering Sea.

It was believed that by the end of January more than 100 vessels in the Soviet fleet were operating generally northwest of the Pribilof Islands in the Bering Sea, reportedly fishing for herring.

Japan: The Japanese shrimp factoryship Chichibu Maru, accompanied by 9 trawlers, returned to the Bering Sea during January and resumed fishing for shrimp north of the Pribilof Islands.



Fig. 2 - Japanese supply ship in Bering Sea.

The large factory stern trawler Aso Maru which had been fishing in the Aleutian Islands reportedly returned to Japan briefly during the month. According to Japanese sources, the vessel Aso Maru, accompanied by one small trawler, was scheduled to sail from Japan on January 21 for the eastern Bering Sea. Three other Japanese factory stern trawlers (the Akebono Maru's Nos. 71 and 72 and the Taiyo Maru No. 82) were also reported fishing in the eastern Bering Sea.

GOOD SALMON RUN FORECAST FOR BRISTOL BAY IN 1965:

Preliminary data indicate that the 1965 sockeye salmon run to Bristol Bay may be the largest since 1960. The 1965 run could total between 20 and 24 million fish (with allowances for the Japanese high seas catch).



Alaska Bristol Bay salmon gill-net vessels docked at a cannery dock.

The Kvichak River run is expected to dominate the fishery as in the "dominant-year" Kvichak runs of 1956 and 1960. Most young sockeye produced by the spawning in 1960 remained in Lake Iliamna 1 year longer than normal. This has caused a 5-year interval between large runs on that cycle.

The preliminary forecast for Bristol Bay is based on studies of spawning from previous runs. This fresh-water information collected by the Alaska State Department of Fish and Game will be combined later with high seas data collected by other agencies to produce a final forecast of the 1965 Bristol Bay run of sockeye salmon. (Alaska Department of Fish and Game, January 6, 1965.)

**SALMON RUNS TO
PRINCE WILLIAM SOUND
AFFECTED BY 1964 EARTHQUAKE:**

In the Prince William Sound area, direct salmon fry losses caused by the earthquake of March 27, 1964, are expected to result in about 330,000 fewer pink salmon in the 1965 run, and 50,000 fewer chum salmon in 1966, 1967, and 1968. Direct salmon fry losses from earth movement and gravel silting caused by the earthquake were relatively minor compared to over-winter mortalities from other sources.

The effect of land changes on subsequent salmon runs will probably be far more important than that caused by direct salmon fry losses in 1964. About two-thirds of the Prince William Sound area was uplifted with the elevation ranging from a few inches to 33 feet. By contrast, about one-tenth of the area dropped from 1 to 7 feet. Since pink and chum salmon in the Prince William Sound area spawn almost entirely in intertidal and immediately adjacent stream zones, adult salmon returning in 1964 were faced with highly altered and often unstable environments for egg deposition. Far fewer spawners used intertidal zones than in previous cycle years, but in the uplifted area 52 percent of the pink salmon spawners utilized riffle areas never before used for spawning. Egg sampling in October 1964 showed that eggs deposited in the "new" riffles were being lost at a fairly high rate compared to eggs in riffles formerly in use, mainly due to excessive erosion in the "new" riffle areas.

The unstable spawning conditions are expected to reduce salmon production for a short period, but the significant increase in spawning ground area caused by land uplift could add greatly to the potential in future years. (Alaska Department of Fish and Game, January 6, 1965.)



Alaska Fisheries Investigations

CHANGES IN KING CRAB ABUNDANCE OBSERVED BY SCUBA DIVERS:

During January 1965, SCUBA divers of the U. S. Bureau of Commercial Fisheries Auke Bay Biological Laboratory made several observations on adult king crab in the Auke Bay area. At the beginning of the month, female *Paralithodes camtschatica* and male and female *P. platypus* were observed in the Auke Bay Recreation area. At that time female *P. platypus* were most abundant. By the middle of the month, the divers were unable to locate any *P. camtschatica*, but reported that the abundance of male *P. platypus* was increasing. During the latter part of January, males (*P. platypus*) were more abundant than females. On at least one occasion, adult males (*P. platypus*) were concentrated into a group or "pod." The first mating pair of *P. platypus* was observed on January 24.



California

SILVER SALMON STOCKING PROGRAM TO CONTINUE:

Despite flood losses in December 1964, the program of stocking 500,000 silver salmon annually in California's north coastal streams is nearly back on schedule. The floods demolished the Cedar Creek Hatchery and carried away 370,000 silver salmon eggs and 120,000 yearling silver salmon. But 380,000 silver salmon yearlings at Darrah Springs Hatchery survived the floods and will be planted on schedule early in 1965 to maintain the stocking program.

In 1966, the planting of 500,000 yearling silver salmon will be made on schedule with stock from the Darrah Springs Hatchery and the Mt. Shasta Hatchery.

"By making above normal use of other facilities on a temporary basis we can maintain the silver salmon program despite loss of the Cedar Creek Hatchery," said the Director of the California Department of Fish and Game. "On a permanent basis, however, maintenance and expansion of the program will probably have to be accomplished at some location other than Cedar Creek since the hatchery site there seems too hazardous from the standpoint of floods to justify re-

building the installation." (California Department of Fish and Game, January 23, 1965.)

SALMON PLANTING PROGRAM IN RUSSIAN RIVER:

The November 1964 planting of 50,000 eight-month-old early winter strain king salmon in the Russian River near Ukiah, Calif. completed the 2nd year of a 4-year cooperative Federal-State program. The program is aimed at establishing a self-sustaining run of kings in the Russian River system. The fish released in November 1964 were from the same hatch as the 500,000 fingerlings that were planted in May 1964. The larger fingerlings have all been marked as a means of checking their return to the river at a future date.

Earlier efforts to establish a fall run of king salmon in the Russian River failed because the adult fish returned to the river at the time when water conditions were unfavorable to successful spawning. Because of that problem, a winter strain of king salmon was introduced in May 1963. At that time 500,000 fingerlings were planted. That was followed in November 1963 with an additional 50,000 marked, larger-sized fingerlings of the same hatchery brood.

It is hoped that the early winter strain will adapt to the Russian River and develop a self-maintaining population.

Salmon fingerlings for the Russian River program are being supplied by the Coleman National Fish Hatchery. (Outdoor California, January 1965.)

PELAGIC FISH POPULATION SURVEY CONTINUED:

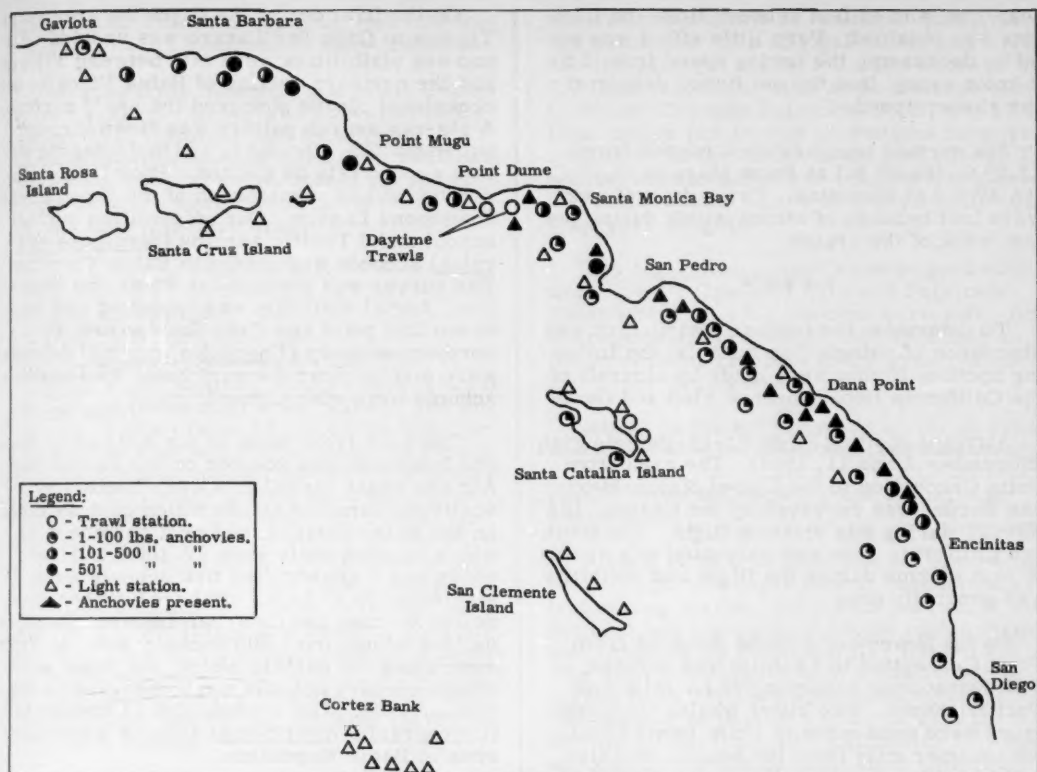
M/V "Alaska" Cruise 64-A8-Pelagic Fish (October 26-November 16, 1964): The purpose of this cruise by the California Department of Fish and Game research vessel Alaska in the coastal waters, islands, and banks of southern California from Gaviota to Cortez Bay was to: (1) survey the pelagic species to determine population densities and to ascertain age and size compositions; (2) assess sardine spawning success for the year 1964; and (3) make underwater measurements and observations of the midwater trawl using different nets, doors, and towing speeds.

The area covered was surveyed by occupying selected midwater trawl and blanket-net-nightlight stations. Both types of stations were occupied in the same general localities whenever practical. Almost all work was conducted at night. A total of 47 blanket-net and 46 midwater-trawl stations were occupied.

Northern anchovies (Engraulis mordax) as usual were by far the dominant species caught. They were taken in all but 4 midwater trawls and were present on 13 blanket-net stations. Jack mackerel (Trachurus symmetricus) were caught in 11 midwater trawls and Pacific sardines (Sardinops caeruleus) in 4. The blanketnet took 1 sardine and 3 jack mackerel samples. Visual scouting between stations totaled 373 miles. Bonito (Sarda chiliensis) surface schools consisting of 3 to 12 fish were frequently sighted north of San Pedro; no other fish schools were seen.

NORTHERN ANCHOVIES: Anchovies were distributed along the entire coastline from San Diego to Gaviota. All midwater trawls made after dark in that area were successful. The heaviest concentrations of fish were located from Santa Monica Bay northward, where substantial catches and dense echosounder traces were made. The best catches were made in water 10 to 35 fathoms deep and over submarine canyons near shore. The offshore islands and banks yielded only 1 anchovy in each of 2 catches. Small fish ranging in size from 60- to 110-millimeters (2.4 to 4.3 inches) body length were present close inshore south of Santa Monica Bay. A few samples of larger fish were caught farther offshore. From Santa Monica Bay northward a high percentage of the fish were over 125 millimeters (4.9 inches) long. The scattered schooling behavior observed on previous cruises was prevalent. No dense schools were seen visually, and no compact traces appeared on the echo-sounder.

During daylight hours, anchovy traces appeared as a thin fuzzy border along the bottom. As darkness approached they rose to form a bank 20 to 50 feet thick, in a depth range of 20 to 120 feet below the surface. The darker the night, the closer the fish approached the surface. Behavior beneath the nightlight in deep water was observed on the echo-sounder. The fish would remain 150 to 200 feet deep with the light at full brightness. When the light was dimmed to almost



Alaska Cruise 64-A8-Pelagic Fish (October 26-November 16-1964).

complete extinction the anchovies would rise to the surface briefly and then descend 50 to 100 feet.

Southern California waters appeared to have a considerably larger anchovy population in 1964 than Baja California, Mexico. The quantity of fish per tow was much higher than on any of the surveys made in Mexico and echo-sounder traces were heavier and more extensive.

JACK MACKEREL: Catches of jack mackerel were small, usually consisting of a few juvenile specimens mixed with larger amounts of other species. Midwater trawling took 11 samples and the blanketnet 3. Nightlight stations on Cortez Bank failed to attract fish on the same night that over 300 tons were caught by the commercial fishing fleet. The fish were concentrated in a small area and could be seen only by aerial fish spotters.

PACIFIC SARDINES: Sardines were taken in 4 midwater trawls and on 1 nightlight station. All were large adults and were caught in minor quantities from San Pedro to San Diego. The 1964 sardine year-class appeared to be totally lacking in southern California.

OTHER SPECIES: No Pacific mackerel (*Scomber diego*) were caught or seen. Juvenile Pacific hake (*Merluccius productus*) ranging in length from 93 to 157 millimeters (3.7 to 6.2 inches) were caught mixed with anchovies south of San Pedro. They were taken in 6 midwater trawls in numbers ranging up to 440 fish. Extensive heavy concentrations of salps in offshore and island waters curtailed trawling because of severe net clogging.

Underwater measurements of the trawl mouth showed that the best net opening and shape was attained by using 4 hydrofoil doors and the standard net. An optimum opening 40 feet across the float line, 30 feet across the

lead line, and 43 feet between float and lead-line was obtained. Very little effect was noted by decreasing the towing speed from 3 to 2 knots except that the net fished deeper at the slower speed.

Sea surface temperatures ranged from 11.6° C. (52.8° F.) at Point Mugu to 18.7° C. (65.6° F.) at Encinitas. Three days of work were lost because of strong winds during the last week of the cruise.

To determine the inshore distribution and abundance of pelagic fish schools, the following spotting flights were made by aircraft of the California Department of Fish and Game:

Airplane Spotting Flight 64-16-Pelagic Fish (November 9 and 11, 1964): The area from Point Conception to the United States-Mexican Border was surveyed by the Cessna "182" N9042T during this spotting flight. The southern California area was subjected to a series of rain storms during the flight and visibility was generally poor.

On the November 9 flight the area from Point Conception to La Jolla was scouted, with rainstorms occurring at La Jolla and Port Hueneme. Two killer whales (Orcinus orca) were seen north of Point Dume about one-quarter mile from the beach. Red tide was in evidence only in the southern part of Santa Monica Bay.

Weather conditions were very poor north of Santa Barbara during the November 11 flight when the area from Santa Barbara to the United States-Mexican Border was scouted. Two small fish schools were seen. The school seen at Newport Beach was not identified. The other was a school of Pacific bonito (Sarda chiliensis) in Santa Monica Bay. Red tide was noticed at La Jolla, Newport Beach, and Santa Monica Bay.

Airplane Spotting Flight 64-17-Pelagic Fish (November 18-20, 1964): The area from Tijuana to Rancho Inocentes and La Paz to San Felipe, Baja California, was surveyed by the Beechcraft N5614D during this spotting flight. It was the last of four (quarterly) experimental survey flights along the coast of Baja California on the distribution and abundance of pelagic fish schools in that area.

On the first day of the flight the area from Tijuana to Cabo San Lazaro was scouted. Air and sea visibilities were fair between Tijuana and the northern section of Bahia Vizcaino but occasional clouds obscured the sea's surface. A zig-zag search pattern was flown throughout Bahia Vizcaino out to and including the waters around Isla de Cedros. Poor flying conditions caused cancellation of the pattern near Scammons Lagoon. One unidentified surface school and 6 Pacific sardine (Sardinops caeruleus) schools were noted in Bahia Vizcaino. The survey was resumed at Punta San Hipolito. Aerial visibility was excellent and between that point and Cabo San Lazaro, 101 northern anchovy (Engraulis mordax) schools were sighted near the surf line. Two sardine schools were also sighted.

The area from Boca de las Animas to Rancho Inocentes was scouted on the second day. Air and water visibilities were limited by scattered cumulus clouds which cast shadows on the water surface, and by a surface wind which created white caps. A total of 11 anchovy and 6 unidentified fish schools were sighted up to 10 miles offshore between Boca de las Animas and Cabo San Lazaro. In Bahia de Magdalena, over 300 anchovy schools were seen along the eastern shore, the same area where anchovy schools were observed in September 1964. Ten sardine and 12 anchoveta (Cetengraulis mysticetus) schools were also seen in Bahia Magdalena.

On the last day of scouting the entire gulf side of the peninsula was surveyed for the first time during this series of spotting flights. Water visibility was poor due to a steady north wind throughout the area surveyed, although 6 unidentified schools were seen close to shore in calm bays.

Airplane Spotting Flight 64-18-Pelagic Fish (December 14 and 17, 1964): The area from Santa Monica to Santa Cruz Point was surveyed by the Cessna "182" N9042T during the December 14 flight. Visibility was excellent throughout the area flown. The ocean's surface was quite calm, especially north of Point Conception. A large northern anchovy (Engraulis mordax) school group was seen near the surf line at Santa Monica. Anchovy schools were also seen at Malibu, Port Hueneme, Estero Point, and Piedras Blancas. Four Pacific bonito (Sarda chiliensis) schools were

spotted near Point Conception. Red tide was noted from Port Hueneme to Santa Barbara.

The area from Jalama Park to the United States-Mexican Border was surveyed on December 17. Visibility was quite good. Two unidentified fish schools were seen near San Onofre and several small school groups of anchovies were again found in the Santa Monica and Port Hueneme areas.

SURVEY OF CRAB AND SHRIMP RESOURCES IN COASTAL WATERS CONTINUED:

M/V "N. B. Scofield" Cruise 64-S-7-Crab and Shrimp (November 4-25, 1964): The objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield in coastal waters from Avila to Crescent City were to: (1) determine pre-season abundance and condition of legal and sublegal crab (*Cancer magister*) in the Eureka-Crescent City area for prediction of the 1964-65 season; (2) collect gravid shrimp (*Pandalus jordani*) from beds off Avila, Bodega Bay, Fort Bragg, and Redding Rock for fecundity studies; (3) collect hake (*Merluccius productus*) and arrowtooth halibut (*Atheresthes stomias*) stomachs for juvenile shrimp abundance studies; and (4) tag sublegal male crab for growth studies.

During the cruise, 10 commercial crab traps were fished overnight at 35 randomly selected stations, 10 traps were fished 5 days and nights at 5 random stations, and 9 traps were fished overnight at one random station in productive crab areas between Crescent City and the mouth of the Eel River, Calif. Shoulder widths of crab were recorded for the entire catch taken on the cruise and shell condition determinations were made for all male crab.

A total of 12 shrimp net tows lasting 10 minutes each was made off Eureka, Fort Bragg, Bodega Bay, and Avila to catch gravid female shrimp.

Poor weather did not permit completion of all random stations chosen and prevented retrieval of the first set for 5 days. The catch-per-unit-of-effort for those 50 traps was corrected to one day's catch. No traps were lost. A total of 7,019 crabs was caught in the 409 trap sets. The catch consisted of 4,735 legal males (7 inches or over in breadth), 2,250

sublegal males, and 33 females. The average catch-per-trap of legal males was 11.6 and for sublegal males 5.5. The average was 7.7 legal males per trap at 25 stations between Crescent City and Patrick's Point, and 17.6 legal males per trap at 16 stations between Trinidad and the mouth of the Eel River. The highest station catch was recorded southwest of Trinidad Head where 27.0 legal males per trap were caught.

The legal crab caught were in good condition between Crescent City and Patrick's Point where only 2.6 percent were soft. An average of 9.6 percent of the legal crab in the area from Trinidad to the mouth of the Eel River were soft.

Based on the survey made so far in 1964 and the 1963 total catch and pre-season survey, the total catch for northern California should range between 3.7 and 5.8 million pounds.

A total of 34.0 percent and 1.1 percent of the sublegal and legal males, respectively, had mating marks. Only 45.5 percent of the females were gravid. Sublegal males tagged and released off Humboldt Bay totaled 299. The crab were tagged with a suture tag designed to be retained when molting occurs. The tagging is part of a study of growth rates for male crab from 100-millimeter (3.9 inches) shoulder width to legal size. Nine sublegal males with experimental suture tags were placed in a local commercial aquarium for observation.

Two shrimp tows each in Areas A (Eureka) and B-1 (Fort Bragg) yielded 500 egg-bearing females. Another 150 gravid female shrimp were taken in Area B-2 (Bodega Bay) in 4 tows. The shrimp were not plentiful in that area but some females had spawned. The 4 tows in Area C (Avila) did not yield adult shrimp in good quantity in all areas.

Hake and arrowtooth halibut stomachs from 120 fish were collected for studies of the abundance of juvenile shrimp in the food of those species.

In cooperation with the International Shark Tagging Program, 7 dogfish (*Squalus acanthias*) and 3 brown smoothhound (*Rhinotriacis henlei*) were tagged and released.

Note: See Commercial Fisheries Review, March 1965 p. 23.

SAN FRANCISCO BAY INVESTIGATIONS CONTINUED:

M/V "Nautilus" Cruises 64-3f-g-h-i-j S. F. Bay Study (August 12-16, September 8-11, 14-15, October 8-9, 13-16, November 5-6, 9-13, December 8-11, 14-15, 1964): Studies in San Francisco Bay were resumed with these cruises by the research vessel Nautilus of the California Department of Fish and Game. Objectives were to: (1) collect fish species and invertebrates routinely at six stations, (2) determine distribution and relative abundance under prevailing environmental conditions, (3) define ecological zones of the Bay, and (4) determine the food organisms of the principal species and their availability.

The six stations worked in the Bay study area had an average depth ranging from 15 to 50 feet.

During the cruise a square-mouthed mid-water trawl 25 feet on a side was towed for 20 minutes at the surface. Each station was also sampled by a 20-minute bottom tow with a 15-foot otter trawl having 1-inch mesh. Plankton tows of 20 minutes were also made at each station with a one-half meter net having 32 meshes per inch.

A total of 64 different fish species have been taken since the study began in February 1963, 20 of them from south of Dumbarton Bridge.

Four days of this cruise were spent assisting the regional Water Pollution Control Board and cooperating agencies in sampling the Bay waters south of Dumbarton Bridge. Two days were used collecting bottom samples from the same area for a wild fowl food study being made by the Department of Fish and Game. Information and material was collected for a study being made at the University of California on the papillomas which appear on English sole that inhabit sewage contaminated areas.

Water temperatures during this cruise were neither as high nor as low as in 1963 but remained in the range of 11° to 20° C. (51.8° to 68.0° F.). The range in 1963 was 9° to 21° C. (48.2° to 69.8° F.). Salinity was much more stable than in 1963.

Note: See Commercial Fisheries Review, November 1964 p. 21.



Central Pacific Fisheries Investigations

ADVANCES MADE IN TUNA BLOOD GROUP STUDIES:

Long-term basic studies of blood groups in tuna have been made for several years by the Subpopulations Program of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. The aim of the studies is to facilitate identification of isolated breeding subpopulations of tunas through the use of blood groups, which serve as genetic markers that are not affected by environment. Provided with such a tool, fishery research biologists will be able to make much more precise analyses of local fishery management problems and world-wide fishery resources as well.



Taking a blood sample from a skipjack tuna.

Two recent technological advances have made possible striking advances in the field of blood group research and its application to the identification of subpopulations. The first breakthrough came with the development of improved techniques for preserving tuna bloods for extended periods by freezing them in a glycerol solution. Those techniques now make it possible not only for the Bureau's Laboratory to preserve specimens over long periods, for use in standardization of reagent, but also presents the possibility of establishing a blood bank of particular blood types for each species of tuna. From such a bank, samples can be sent to other researchers in this field for use in comparison and standardization.

The second major advance has been the recognition of a new blood group system in skipjack tuna. This new system has been temporarily named the YS blood group system and consists of three blood groups--Y, YS, and S--which are detected by the interaction of two reagents, anti-Y and anti-S. The reactions that distinguish those blood groups are shown in the table. The plus sign (+) in-

YS Blood Group System		
Blood types	Reagents	
	Anti-Y	Anti-S
Y	+	-
YS	+	+
S	-	+

indicates the presence of a particular blood factor, and the minus sign (-) indicates its absence.

The significant feature of the new blood group system is that the genetic relationships responsible for those blood types can be established directly from the Hardy-Weinberg formula. This fact also makes it possible to perform statistical analysis of skipjack population samples and determine whether these samples were taken from a pure isolated breeding population or from a mixed group.

With the use of the two new discoveries and vigorous pursuit of the present basic program, it is hoped that in the near future knowledge of the population structure of all tuna in the Pacific area will be greatly increased. Such information concerning the skipjack would be most significant, since at present the potential of that tuna species is not fully realized.

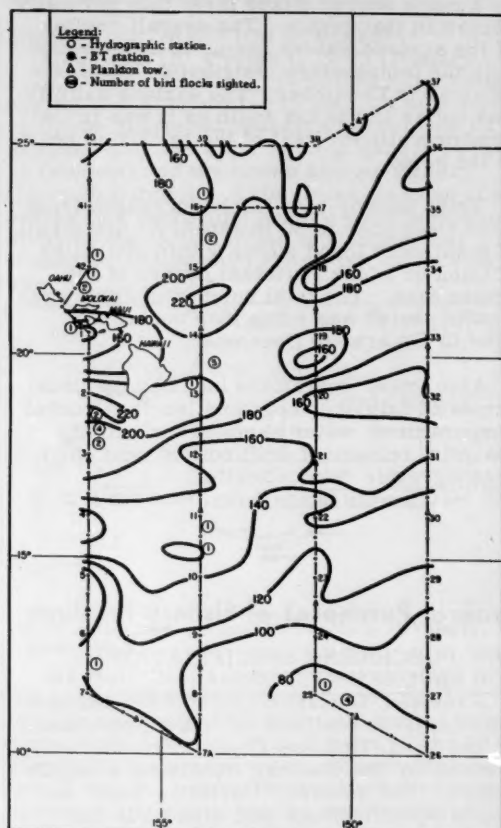
Note: See *Commercial Fisheries Review*, November 1964 p. 26.

TRADE WIND ZONE

OCEANOGRAPHIC STUDIES CONTINUED:

M/V "Townsend Cromwell Cruise 12 (January 5-24, 1965): This was the eleventh in a series of oceanographic cruises by the research vessel Townsend Cromwell to collect data on rates of change in the distribution of properties in the trade wind zone of the central North Pacific Ocean. The research vessel is operated by the Biological Laboratory of the U. S. Bureau of Commercial Fisheries, Honolulu, Hawaii, which on this cruise operated and collected data in an area of the central North Pacific bounded by latitudes 10° N., 27° N. and longitudes 148° W., 158° W.

A total of 43 oceanographic stations was occupied along the cruise track. At each station, temperatures and samples for salinity analysis were obtained at 20 depths to 1,500 meters (4,921 feet). Deep casts to 4,000 meters (13,123 feet) were taken at stations 25, 38, and a cast to 3,000 meters (9,482 feet) was taken at station 21.



Track chart of M/V Townsend Cromwell Cruise 12 (January 5-24, 1965) showing depth contours of the 20° C. isotherm depth in meters.

Oceanographic conditions in January 1965 appeared to be nearly the same as for December, although some changes had occurred. Over the entire cruise area, the depth of the 20° isotherm was nearly 20 meters (66 feet) greater than in the previous month of December. It was even greater in the southern portion which indicates further relaxation of the westerly flow. The flow pattern, however, was nearly the same as in December. In the north, there was a new set of well-formed eddies, with maximum depths of the 20° isotherm greater than appeared in December. The distribution of those eddies was different than seen before with one exception. The clock-wise eddy centered near 18° N. and 157° W., which first appeared in October 1964, has remained and now covers a larger area. This is reflected in the temperature section

by a much deeper mixed layer than normally occurs in that region. The overall cooling of the surface waters seems to have ceased with the temperature distribution nearly the same as in December. The surface salinity was not as low in the south as it was in December while the rest of the pattern is nearly the same.

Total feeding-bird flocks increased from 20 in December to 30 in January. Almost all of them were found either within 200 miles of Oahu or in the southeast corner of the cruise area. The total number of birds seen on this cruise was more than double that seen in the area in December.

Also, other operations included the usual series of bathythermograms, surface bucket temperatures, water samples for salinity analysis, release of drift bottles, and other oceanographic data collection.

Note: See *Commercial Fisheries Review*, March 1965 p. 27.



Federal Purchases of Fishery Products

NEW PURCHASING SPECIFICATIONS FOR SHUCKED OYSTERS:

A revised "Deviation List" for raw shucked oysters, fresh (chilled) or frozen, purchased by the U. S. Defense Department was announced by the Defense Subsistence Supply Center. The revised "Deviation List" includes specifications and standards for shucked oysters. It will be effective with purchase contracts awarded on and after March 1, 1965.



Florida

NEW MARINE LABORATORY FOR UNIVERSITY OF MIAMI:

Construction has begun on a new million-dollar laboratory building at the Institute of Marine Science, University of Miami. Construction costs in the amount of \$1,040,000 will be paid by the National Science Foundation. The new building will house the Institute's Division of Physical Sciences, which investigates ocean currents, waves, tides, the sea floor and underlying layers, and other factors in the marine world. Such research includes studies of underwater sound and

light, the chemistry of sea water and deep-sea sediments, and the distribution of radioactive elements in sea water. With the construction of the new building, to be completed by early fall of 1965, many of the activities of those various research programs will be concentrated in a single location.

The new 3-story laboratory building will have more than 40,000 square feet of working space. The ground floor will contain model basins and pressure tanks and will include space for a rotating tank and a soundproof chamber. The tanks will simulate certain conditions of the open sea for experimental purposes. Second and third floors will house offices and laboratories, as well as classrooms, a computer room, chartroom, draftroom, and a communications center for maintaining radio contact with the Institute's fleet of vessels. The Institute owns and maintains more than 20 research vessels and small craft, including two ocean-going vessels, *Pillsbury* and *Gerda*, which frequently range thousands of miles from their home port, working in both eastern and western Atlantic waters.

Established in 1943, the Institute of Marine Science now occupies a 5½-acre tract on Virginia Key near Miami, Fla., and employs more than 300 scientists, technicians, and administrative employees. Next fall the entire Virginia Key campus will be officially dedicated, with ceremonies featuring educators, oceanographers, and government leaders from all over the world. (University of Miami, January 27, 1965.)



Frozen Food

PACKERS CONVENTION HELD IN SAN FRANCISCO:

The 24th Annual Convention of the National Association of Frozen Food Packers was held in San Francisco, Calif., February 28 to March 3, 1965. All sections of the frozen food industry were represented at the convention including brokers, distributors, retailers, warehousemen, transportation people from both the rail and trucking industries, suppliers, and packers.

The theme was "Zero-in on Tomorrow." The program of the convention emphasized specific ways to increase sales in both the retail and institutional markets.

Time magazine sponsored one of the general sessions at the convention. Representatives from Time conducted the audience through a unique slide show to demonstrate seven distinct types of consumer markets for frozen foods. The presentation included an up-to-the-minute look at what consumers are buying, based on a survey made in 1965 just before the convention. Other general sessions heard retail and institutional specialists discuss ways of improving sales.

Technical sessions of the convention included discussions of new research developments such as: (1) freeze-drying and (2) liquid nitrogen processing for frozen foods. Technical sessions also brought together transportation executives and frozen food packers to discuss current problems and future needs in transportation of frozen foods.

An interesting feature of the convention was a display of the latest in equipment, services, and supplies available to frozen food packers. Leading United States manufacturers displayed their products at the exposition.



Great Lakes

SALMON STOCKING WORK CONTINUES:

Another 500,000 fertilized silver or coho salmon eggs were flown to Michigan in February 1965, stepping up the Michigan conservation Department's opening efforts to add this western species to the Great Lakes. The February shipment of eggs was donated by the State of Washington. It matches a January 1965 shipment of 500,000 coho eggs from Oregon.

Survivors from the total batch of 1 million salmon eggs will be released next fall or in the spring of 1966 as "seed" stock in northern tributaries of the Great Lakes where their chances of spawning are expected to be best.

Other introductory plantings are scheduled for each of the following 2 years in hopes that these hard-fighting game fish will take hold and develop spawning runs from which Michigan can get its own source of coho eggs for future releases. (Michigan Department of Conservation, February 4, 1965.)

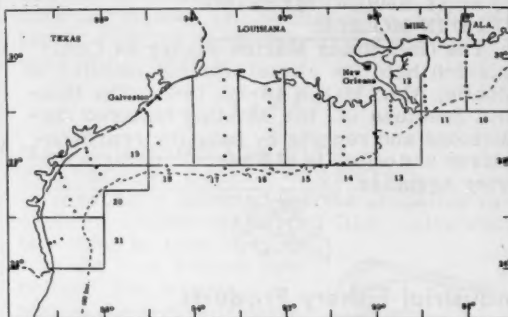
Note: See Commercial Fisheries Review, March 1965 p. 33.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-25 (January 6-18, 1965): Trawling operations during this shrimp sampling cruise in the Gulf of Mexico by the chartered research vessel Gus III sampled only the white shrimp fishery (4 to 15 fathoms) and the brown shrimp fishery (15 to 25 fathoms). This cruise was one of a series in a continuing shrimp distribution study by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex.



Station pattern for shrimp distribution studies by M/V Gus III, Cruise GUS-25.

Six statistical areas off the Louisiana coast to Texas were covered and standard 3-hour tows with a 45-foot Gulf shrimp trawl were made. A total of 18 flat-trawl and 90 plankton tows were made, 62 bathythermograph and 167 water (Nansen bottle) samples taken, and 167 drift bottles were cast at 27 stations.

Fair catches of small brown shrimp (41-50 count) were made in the 10-20 fathom depth range of area 18. The over 20-fathom depth in area 20 yielded 19 pounds of 21-25 count brown shrimp, and 7 pounds were taken from the 10-20 fathom depth of the same area. The largest white shrimp catch of the cruise (30 pounds of 51-67 count) was from the tow in the up to 10-fathom depth of the same area.

Area 13 yielded 47 pounds of small white shrimp counting from 51 to 68 shrimp to the pound--22 pounds from the up to 10-fathom depth and 27 pounds from the 10-20 fathom depth range. A total of 9,000 white shrimp (51-67 count) was caught in areas 13 and 20.

The up to 10-fathom depth of areas 17, 18, and 19 yielded only fair catches of small

white shrimp ranging from 8 to 9 pounds per tow.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, March 1965 p. 35.



Gulf States Marine Fisheries Commission

ANNUAL SPRING MEETING HELD IN MOBILE:

The Gulf States Marine Fisheries Commission held its annual shrimp meeting in Mobile, Ala., March 18-19, 1965. The General Sessions of the Meeting featured discussions and reports by industry representatives and officials of Federal and State Fisheries agencies.



Industrial Fishery Products

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, 1963-64: Based on domestic production and imports, the United States available supply of fish meal for 1964 amounted to 648,079 short tons--15,851

tons (or 2.5 percent) more than during 1963. Domestic production was 46,941 tons (or 18.3 percent) less, but imports were 62,792 tons (or 16.7 percent) higher than in 1963. Peru continued to lead other countries with shipments of 348,025 tons.

The United States supply of fish solubles during 1964 amounted to 87,439 tons--a decrease of 23.6 percent as compared with 1963. Domestic production dropped 22.8 percent and imports of fish solubles decreased 36.7 percent.

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, December 1964: During December 1964, a total of about 5.8 million pounds of marine animal oils and 7,287 tons of fish meal was produced in the United States. Compared with December 1963 this was a decrease of 609,000 pounds of marine-animal oils and 2,668 tons of fish meal and scrap. Fish solubles production amounted to 2,595 tons--a decrease of 931 tons as compared with December 1963.

Menhaden oil production amounted to 5.3 million pounds--a decrease of 49,000 pounds. Menhaden fish meal and scrap production in December 1964 amounted to 4,957 tons--a decrease of 1,290 tons as compared with the same month of 1963.

Item	1/1964	1963
	... (Short Tons) ...	
Fish Meal and Scrap:		
Domestic production:		
Menhaden	151,991	184,205
Tuna and mackerel	26,324	26,957
Herring, Alaska	9,372	7,537
Other	21,279	37,208
Total production	208,966	255,907
Imports:		
Canada	54,739	50,985
Peru	348,025	285,414
Chile	12,942	23,567
Norway	-	1,819
So. Africa Republic	18,581	12,296
Other countries	4,826	2,240
Total imports	439,113	376,321
Available fish meal supply	648,079	632,228
Fish Solubles:		
Domestic production 2/	82,934	3/107,402
Imports:		
Canada	1,553	2,233
Iceland	-	160
So. Africa Republic	987	511
Other countries	1,965	4,208
Total imports	4,505	7,112
Available fish solubles supply	87,439	114,514

1/ Preliminary.

2/ 50-percent solids.

3/ Includes production of homogenized condensed fish.

Product	Dec.		Nov.		Jan.-Dec.	
	1/1964	1963	1/1964	1963	1/1964	1963
	(Short Tons)					
Fish Meal and Scrap:						
Herring	2/	29	295	16	9,372	7,537
Menhaden 3/	4,057	6,247	5,387	8,778	151,991	184,205
Tuna and mackerel	1,687	3,143	2,026	3,745	26,324	26,957
Unclassified	643	536	1,214	777	21,279	22,415
Total	7,287	9,955	8,922	13,316	208,966	241,114
Shellfish, marine-animal meal and scrap	4/	4/	4/	4/	4/	14,793
Grand total meal and scrap	4/	4/	4/	4/	4/	255,907
Fish Solubles:						
Menhaden	1,692	2,223	1,838	3,324	64,307	74,831
Other	903	1,303	1,013	1,562	18,627	25,347
Total	2,595	3,526	2,851	4,886	82,934	100,178
Homogenized condensed fish	-	-	-	-	-	7,224
	(1,000 Pounds)					
Oil, body:						
Herring	2/	294	-	279	9,988	5,709
Menhaden	5,293	5,342	6,077	9,195	148,813	167,635
Tuna and mackerel	240	523	490	439	5,642	5,903
Other (including whale)	252	235	211	176	6,207	5,580
Total oil	5,785	5,394	6,776	10,089	170,548	185,327

1/ Preliminary data.

2/ Included in "Unclassified."

3/ Includes a small quantity of thread herring.

4/ Not available on a monthly basis.

* * * * *

Production by Areas, January 1965: Preliminary data on U. S. production of fish meal,

oil, and solubles for January 1965 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U.S. Production 1/ of Fish Meal, Oil, and Solubles, by Areas, January 1965 (Preliminary) with Comparisons			
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles Short Tons
January 1965:			
East & Gulf Coasts. . . .	725	313	63
West Coast 2/	1,680	223	1,051
Total	2,405	536	1,114
January 1964 Total	1,895	709	1,290

1/Does not include crab meal, shrimp meal, and liver oils.

2/Includes American Samoa and Puerto Rico.

Major Indicators for U. S. Supply, December 1964: United States production of fish meal in December 1964 was lower by 26.8 percent as compared with December 1963. Production of fish oil was down by 9.5 percent and production of fish solubles decreased 26.4 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, December 1964					
Item and Period	1/1964	1963	1962	1961	1960
(Short Tons)					
Fish Meal:					
Production:					
December 2/	7,287	9,955	2,683	12,763	9,178
Year 3/	208,966	255,907	312,259	311,265	290,137
Imports:					
December	37,793	29,729	18,977	23,268	15,564
Year	439,113	376,321	252,307	217,845	131,561
Fish Solubles:					
Production: 4/					
December 2/	2,595	3,526	1,838	4,936	2,897
Year 3/	82,934	107,402	124,649	112,254	98,929
Imports:					
December	277	3,160	387	472	60
Year	4,505	7,112	6,308	6,739	3,174
(1,000 Lbs.)					
Fish Oils:					
Production:					
December 2/	5,785	6,394	690	11,191	7,737
Year	107,648	185,822	250,075	258,118	209,143
Exports:					
December	11,120	33,262	172	10,484	15,807
Year	151,469	262,342	123,050	122,486	143,659

1/Preliminary.

2/Data for 1964 based on reports which accounted for the following percentage of production in 1963: Fish meal, 95 percent; solubles and homogenized fish, 99 percent; and fish oils, 99 percent.

3/Small amounts (10,000 to 25,000 pounds) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.

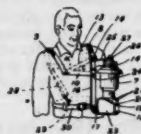
4/Includes homogenized fish prior to 1964--none produced in 1964.



Inventions

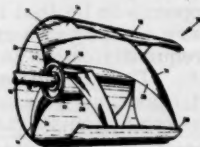
FISHERMAN'S PORTABLE LIGHT PATENTED:

The inventor of a portable lantern for fishermen claims it can be carried on a shoulder harness without hampering normal movements. The lantern can be positioned so that the wearer avoids direct glare from the light. It is said to be of lightweight construction, easy to put on and fasten securely, and also easy to remove. (U. S. Patent No. 3,106,350 issued Charles F. Wiltse, 325 N. Center St., Sebawaing, Mich.)



MARINE PROPELLER WITH PROTECTIVE CASING PATENTED:

A recently patented marine propeller includes a cylindrical shroud-like casing which is welded or cast integral with the 2- or 3-blade propeller. The inventor claims the device protects the blades from impact with submerged objects. The inventor also says that the shroud, which tapers rearward, increases water flow past the propeller and eliminates cavitation. (U. S. Patent No. 3,148,736 issued Joseph Skopyk, 3911 Bloor Street West, Islington, Toronto, Canada.)



Maine Sardines

CANNED STOCKS, JANUARY 1, 1965:

Canners' stocks of Maine sardines on January 1, 1965, were down sharply from those of the same date in 1964 and 1963, but 394,000 cases above stocks on hand 3 years ago on January 1, 1962 (the pack for the 1961 season was exceptionally small).

Carryover stocks at the canners' level amounted to about 622,000 cases on April 15, 1964, which is the traditional opening date of the Maine sardine packing season. Carryover stocks amounted to 660,000 cases on April 15, 1963, but only 33,000 cases on April 15, 1962, following the short-pack year.

Canned Maine Sardines--Wholesale Distributors' and Cannery's Stocks, January 1, 1965, with Comparisons 1/													
Type	Unit	1964/65 season		1963/64 Season						1962/63 Season			
		1/1/65	11/1/64	7/1/64	6/1/64	4/1/64	1/1/64	11/1/63	7/1/63	6/1/63	4/1/63	1/1/63	11/1/62
Distributors	1,000 actual cases	238	291	234	254	291	261	308	217	215	264	271	230
Cannery	1,000 std. cases 2/	538	629	514	499	658	1,063	1,255	643	536	699	1,092	1,348

1/ Table represents marketing season from November 1-October 31.
2/ 100 3 1/2 -oz. cans equal one standard case.

Note: Beginning with the Canned Food Report of April 1, 1963, U.S. Bureau of the Census estimates of distributors' stocks were based on a revised sample of merchant wholesalers and warehouses of retail multiunit organizations. The revised sample resulted in better coverage. The January 1, 1963, survey was conducted with both samples to provide an approximate measure of the difference in the two samples. That survey showed that the estimate of distributors' stocks of canned Maine sardines from the revised sample was 13 percent above that given by the old sample.

Source: U.S. Bureau of the Census, Canned Food Report, January 1, 1965.

The 1964 Maine sardine pack at the close of the season on December 1, 1964, totaled about 875,000 standard cases, according to the Maine Sardine Council. That was much less than the 1,585,000 cases packed during 1963, but more than the 679,000 cases packed during the regular season in 1961 when fishing was extremely poor.

According to the Maine Sardine Council, neither cannery, fishermen, nor scientists could offer any clear-cut explanation for the scarcity of fish during 1964. The consensus appears to be that it was probably a temporary combination of natural conditions that frequently occur in all populations of marine life. They see no evidence that the condition will continue to exist during the 1965 packing season which starts next spring.

Note: See Commercial Fisheries Review, Feb. 1965 p. 27.



Marketing

EDIBLE FISHERY PRODUCTS, 1964 AND OUTLOOK FOR 1965:

The 1964 United States catch of edible fish and shellfish dropped from the previous year. There were sharp declines in landings of Maine herring, shrimp, ocean perch, tuna, jack mackerel, halibut, whiting, cod, and scallops. Landings were heavier than in 1963 for only a few of the major species. Total supplies in 1964 were up, however, because larger frozen stocks were available as the year began and imports exceeded those of 1963. The rise in supplies of edible fishery products paralleled the rise in population, so per capita consumption in 1964 held about steady at 10.6 pounds. Retail prices for fishery products averaged a little lower in 1964 than the year earlier. But prices of several shellfish and some finfish items strengthened as supplies fell short of market needs toward the end of the year. Prices for shrimp, scal-



The so-called "Old Shed" area of New York City's Fulton Fish Market with East River Drive overpass in foreground.

lops, and spiny lobster tails advanced markedly during the year.

Fishery products supplies are expected to be lighter in early 1965 than in 1964. The supply of shellfish likely will be much below consumer needs. Frozen stocks of edible fish and shellfish held in cold-storage at the beginning of 1965 were down about 13 percent from a year earlier. The 1964 canned pack of fishery products was about the same as in 1963. Distributors are expected to draw heavily on cold-storage holdings and canned inventories until fishery landings increase seasonally starting in the spring.

On the average, prices may edge up and be slightly higher early in 1965 than they were a year earlier. United States imports of edible fish and shellfish will likely continue an upward trend. No change is foreseen in the per capita consumption rate of fishery products in 1965.

Note: This analysis was prepared by the Bureau of Commercial Fisheries, U.S. Department of the Interior, and published in the U.S. Department of Agriculture's February 1965 issue of the "National Food Situation" (NFS-111).



Maryland

STANDARDS FOR OUT-OF-STATE SHELLFISH ARRIVALS:

A Maryland law which became effective June 1, 1964, prohibits the importation into the State of all food products containing shellfish unless the shellfish is from sources which have been certified by the U. S. Public Health Service for interstate shipment. The law further states that all processors of food products containing imported shellfish must keep on file proof that the shellfish is from sources certified through the U. S. Public Health Service and shall forward to the Maryland State Department of Health such proof, if and when it is requested by the Department.

STUDY PROPOSED ON BOOSTING FISHERIES OUTPUT:

In February 1965, the Maryland State Government was asked to set up a commission to study ways of increasing Maryland's fisheries production, particularly in the Chesapeake Bay area. The commission would be asked to submit its findings to the Maryland State Legislature in 1966.

A State Senator supporting the proposed commission said, "We need recommendations on modern methods that can revitalize our seafood output, and it has to be done as quickly as possible. We are losing our oyster market to parts of Florida, Texas, and Louisiana, and even some of our seafood processing plants are closing. Not only must we be brought up to date on latest methods for increasing production, but also on ways to better protect the clean waters and seafood areas we now have."

The Senator said the commission membership should include Maryland watermen, as well as representatives of State agencies responsible for protecting Maryland waters. Other members should include marketing experts and economists, he added.

He pointed out that results of the study would fit into a long-range economic development program for southern Maryland formulated by State legislators from St. Marys, Charles, and Calvert Counties. (Washington Evening Star, February 7, 1965.)

NEW RESEARCH VESSEL FOR UNIVERSITY OF MARYLAND:

The 52-foot research vessel Orion was scheduled to sail in February 1965 from a boatyard in New Orleans, La., to the Chesapeake Biological Laboratory of the University of Maryland Natural Resources Institute. The Orion replaces the Cobia, which was retired in 1964. The steel-hulled, shallow-draft Orion is well suited to the choppy and sometimes ice-covered waters of Chesapeake Bay. Special gear on the vessel will enable University of Maryland scientists to trawl for fish and plankton specimens; gather oyster and crab samples; and make bottom and hydrographic surveys. Powered by two 300-horsepower diesel engines, the new vessel is expected to help scientists sample large areas of Chesapeake Bay under fast-changing tide, weather, and biological conditions.



North Atlantic

FOREIGN FISHING ACTIVITIES OFF COAST, FEBRUARY 1965:

In order to observe foreign fishing activities in the North Atlantic, the staff of the Fisheries Resource Management Office, U. S. Bureau of Commercial Fisheries, Gloucester, Mass., has been conducting weekly reconnaissance flights cooperatively with the U. S. Coast Guard.



Fig. 1 - Aerial view of Soviet refrigerated fish transport *Aleksei Venetsianov* with factory stern trawler alongside. South Block Island (Block Canyon), January 1965.

Soviet fishing vessel activity in the North Atlantic increased substantially from January to February 1965. In February a total of

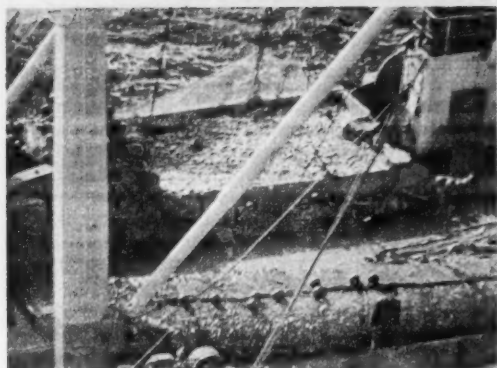


Fig. 2 - Aerial view. Cod end on deck of Soviet factory stern trawler with estimated catch of 40,000 pounds of whiting and red hake. Also note substantial amounts in open storage. South of Nantucket Lightship (Veatch Canyon), January 1965.

42 vessels were sighted and identified as 29 fish-factory stern trawlers, 7 refrigerated side trawlers (*Pioneer* class), 4 refrigerated and processing transports, 1 fuel and water tanker, and 1 tug. This compares with 26 vessels sighted during January, and with only 10 stern trawlers reported on Georges Bank at the same time a year earlier.



Fig. 3 - Aerial view. Large quantities of red hake awaiting to be processed on board Soviet factory stern trawler. South of Nantucket Lightship (Veatch Canyon), January 1965.

Soviet fishing operations during the month generally ranged from south of Montauk Point (Hudson Canyon) eastward along the 100-fathom curve of the Continental Shelf southeast of the Nantucket lightship (Hydrographer Canyon). Each vessel was actively engaged in fishing and had substantial quantities of fish on deck--predominately whiting and red hake.

Their dehydration plants were continually working, indicating that a portion of their catch was being used for fish meal.

The Soviet's apparent success in this present fishery is demonstrated by the increased number of stern trawlers, and more recently, the addition of large refrigerated side trawlers. The refrigerated side trawlers have never been known to fish areas that far south, and a guess is that their presence was caused by lagging fish production in other areas. The processing and refrigerated transport vessels observed during February were not previously seen and are believed to be new vessels put in operation within the past 12 months.

Fishing vessels operating out of New York City reported seeing Soviet vessels fishing in an area 70 to 80 miles southeast of Cape May, N. J. Indications were that 6 to 8 stern trawlers and several side trawlers were present in that area. Landings by the New York vessels during February were primarily scup. It was assumed the Soviets were also fishing for scup.

Note: See *Commercial Fisheries Review*, March 1965 p. 43.



North Atlantic Fisheries Explorations and Gear Development

OFF-BOTTOM TRAWLING EXPERIMENTS CONTINUED:

M/V "Delaware" Cruise 64-12 (November 30-December 11, 1964): To catch ocean perch (*Sebastes marinus*) found small distances above the rough bottom along the Nova Scotia coast from Liverpool east to Halifax was the objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel *Delaware*. The bottom in the area covered, in depths of 80 to 120 fathoms, is relatively rough although it is fished by commercial vessels on a limited scale during certain seasons.

The cruise was made as a continuation of studies initiated in September 1964 (M/V *Delaware* Cruise 64-8) for testing trawls rigged to fish at closely regulated heights above the bottom. If the slope was steep enough, the footrope of the net made contact with the peak (F) and stayed in contact until the doors again reached level bottom. This situation caused considerable damage to the lightly constructed net. Another factor con-

tributing to the net damage was the use of long ground cables and bridles necessary to allow the net to rise behind the doors. On several occasions the top wings and headrope sections of the net were damaged, suggesting that the long bridles and legs are subject to being snagged by obstructions, pulling the headrope down. Erratic height fluctuations of the net are also believed to be caused by this factor.

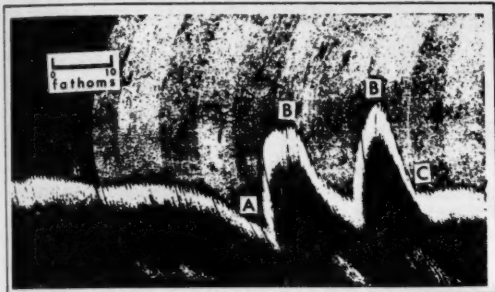


Fig. 1 - Shows bottom profile from vessel's transducer--Net behavior over rough bottom, M/V Delaware Cruise 64-12.

During the second phase of the cruise a roller rigged number 41 manila trawl attached to the doors by 5-fathom legs and 20-fathom ground cables was tested. The doors were the same as used in the first phase (4 ft. x 8 ft., 1,250 lbs.). The headrope was suspended by 8-inch aluminum floats and 6 floats were attached to the gore in the belly sections to keep the after portions clear of the bottom. Dropper chains, 3 fathoms long and weighing 55 pounds each, were fastened to the wing ends (as in the first phase) to help stabilize the fluctuations in elevation of the net. That net, so rigged, maintained a footrope height of about one-half fathom above the bottom when fished on smooth bottom. But on rough bottom the same problems experienced with the midwater trawl were encountered and the net was damaged frequently.

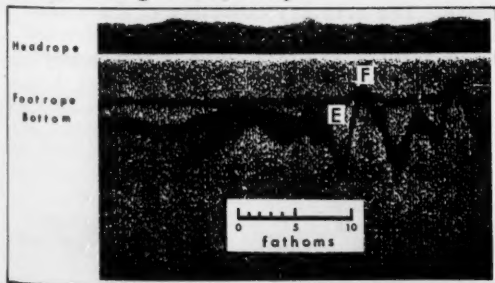
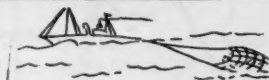


Fig. 2 - Shows footrope and bottom tracing from headrope transducer, M/V Delaware Cruise 64-12.

Only limited quantities of fish were located during the cruise; the best catch made during a 1-hour tow was 2,500 pounds of ocean perch. Although the nets can be rigged to maintain a constant height above smooth bottom and catch fish beyond the reach of nets now commonly used on the East Coast, the feasibility of using these methods to fish regularly untrawlable bottom is questionable in view of the damage sustained during these operations.

Note: See Commercial Fisheries Review, December 1964 p. 50.



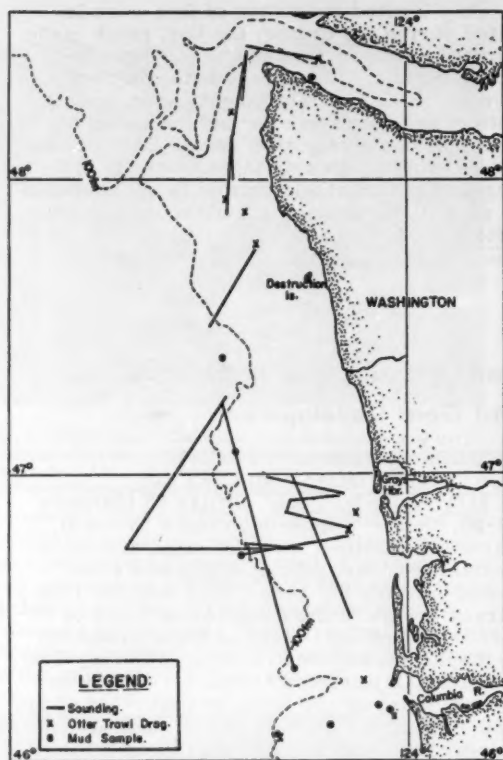
North Pacific Fisheries Explorations and Gear Development

DEMERSAL FISH OFF PACIFIC NORTHWEST COAST SURVEYED:

M/V "John N. Cobb" Cruise 69 (January 12-20, 1965): A nine-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb was completed January 20, 1965. This was the 16th survey cruise in the cooperative study of demersal fish off the Columbia River conducted by the Bureau and the U. S. Atomic Energy Commission. Objectives were to: (1) sample demersal fauna at 100 fathoms southwest of the Columbia River mouth for radiological analysis by the Laboratory of Radiation Biology at the University of Washington; (2) run echosounding transects along the Washington coast to detect any hake concentrations and to fish on "strong signs" with a bottom trawl when they occurred near bottom; (3) establish and monitor a series of standard stations off the northern Washington coast; and (4) collect samples of fish, shellfish, and mud for Clostridium botulinum analysis by the Bureau's Technological Laboratory at Seattle, Wash. Unusually good weather throughout the cruise permitted all objectives to be realized.

Since the majority of drags during the cruise were made between 20 and 50 fathoms, the catches were dominated by sand sole (Psetichthys melanostictus), English sole (Parophrys vetulus), sand dab (Citharichthys sordidus), Bellingham sole (Isopsetta isolepis), and skate (Raja binoculata). Five large white sturgeon (Acipenser transmontanus) were caught in 37 to 49 fathoms off the northern Washington coast.

Samples of Dover sole (Microstomus pacificus), rex sole (Glyptocephalus zachirus),



M/V John N. Cobb Cruise 69 (January 12-20, 1965).

sablefish (*Anoplopoma fimbria*), and 3 different species of rockfish (*Sebastes elengatus*, *flavidus*, and *pinniger*) were collected and frozen for the Laboratory of Radiation Biology. Additional samples of rex sole plus petrale sole (*Eopsetta jordani*) and Dungeness crab (*Cancer magister*) were earmarked for botulism studies.

With a six-foot gravity corer and/or a Dietz-LaFond bottom sampler, 11 substrate samples were obtained at depths from 18 to 660 fathoms. Those samples were to be cultured by the Bureau's Seattle Technological Laboratory to determine the presence or absence of *Clostridium botulinum*.

Hake reconnaissance, using a high-resolution low-frequency echo-sounder, was conducted along 16 transects which varied in length from $2\frac{1}{2}$ to 57 miles. Major emphasis was given to the area off Willapa Bay and Grays Harbor with one transect extending 55 miles off the coast. With the exception of a

few isolated schools of what appeared to be anchovies, and a slight "show" at depths between 25 and 35 fathoms below the surface in 1,060 fathoms of water (55 miles west of Grays Harbor), no recognizable midwater concentrations of fish were encountered.

The John N. Cobb was scheduled to leave Seattle on February 1 for a six-week exploratory hake fishing survey (Cruise No. 70) of Pacific Coast waters from Puget Sound to northern Mexico. In southern California waters, hake explorations will be coordinated with the Bureau's research vessel Black Douglas, and with personnel of the Bureau's Biological Laboratory, La Jolla, Calif.

The area of operations during this cruise will be in northern Puget Sound, off the coasts of Washington, Oregon, California, and northern Mexico.

The primary purpose of Cruise 70 will be to determine the availability of hake (*Merluccius productus*) in Pacific Coast waters during late winter and early spring months which corresponds to the hake's spawning period. Core samples of the substrate will be taken south of the Columbia River for the Bureau's Seattle Technological Laboratory for use in studies on *Clostridium botulinum*.

Note: See Commercial Fisheries Review, November 1964 p. 46.

North Pacific Fishery Investigations

WINTER DISTRIBUTION OF SALMON IN NORTHWESTERN PACIFIC STUDIED:

The research vessel George B. Kelez, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Seattle, Wash., was scheduled to begin, on or about February 1, 1965, a two-month salmon research cruise in the northwestern Pacific Ocean. The primary objective of the winter cruise was to determine the distribution and abundance centers of salmon in the western



Research vessel George B. Kelez of the U.S. Bureau of Commercial Fisheries.

Aleutians, in areas previously fished during the months of September and October.

During the summer, the majority of immature salmon in the Aleutian area move westward along the south side of the island chain and in September-October have been found in concentrations between Attu and the Kammandorsky Islands. Using surface gill nets as the primary sampling gear, the vessel was to attempt to determine whether the fish remain to the west in winter, move into the Bering Sea, or travel south and east back to the central North Pacific. For fish concentrations, long lines were to be used to capture live salmon for tagging so as to determine the area of origin of those fish. Salmon samples were to be brought back to the Bureau's laboratory for use on investigations of racial origin, age, growth, and other biological studies. This salmon research cruise was scheduled for completion by the end of March 1965.

Note: See Commercial Fisheries Review, July 1964 p. 30.



Oceanography

BASIC LINK IN MARINE FOOD CHAIN DISCOVERED:

Three United States scientists have recently discovered what they believe to be a vast unsuspected food supply for marine life.

This previously unknown link in the marine food chain, they believe, consists of non-living organic particles constantly being caught on air bubbles in the sea. These bits of brown matter are eaten by the tiniest sea animals, called zooplankton, which in turn are the basic food supply for higher marine life.

For the past 100 years, scientists believed that the tiny sea animals ate only tiny sea plants, and that these plants absorbed the inorganic matter that came from decomposed fish and other sea creatures. In other words, they believed that the cycle of life was fed only by life or remains of life.

Now, scientists understand that the zooplankton eat accumulated particles of organic nonliving material.

This explains the former mystery of how the tiny sea animals could live during the winter months when the food supply furnished

by tiny plants (photoplankton) was depleted and how they could live in the deep dark water beyond the depth of the tiny plants which need sunlight for their life processes.

Long aware of large quantities of both dissolved and clumped organic matter in the oceans, scientists have estimated the total nonliving organic content of sea water to be at least 50 times larger than the living portion.

Joint discoveries of this vast source of food in the sea were made by a scientist at Yale University and two scientists at the Woods Hole (Mass.) Oceanographic Institution. Their research was conducted under grants from the National Science Foundation.

"We don't exactly yet know what these brown particles are," one of the scientists said. "But we do know they are mixtures of such things as fatty acids, proteins, carbohydrates, and polypeptides." These organic particles, all essential parts of the building blocks of life, are formed when dissolved organic matter in the sea sticks onto air bubbles. The scientists discovered this process in the laboratory and found that continued bubbling resulted in the buildup of larger clumps of particles.

One of the scientists said that, in the ocean, the process works something like this: As waves break across the ocean and form white caps, they drop foaming water twice as deep into the sea as the wave is high. Churning air bubbles provide a surface upon which the dissolved substances of the sea adhere to form larger particles.

As the air bubbles rise to the surface of the ocean, the wind blows the foam into long lines or windrows of spume and brings the particles together in a film which might be a molecule thick. This film is pushed around by the wind and the waves and becomes wrinkled, piled up, and folded over to form aggregates of particles which are large enough for tiny sea animals to eat.

Some of these particles begin to sink slowly through the ocean, and as they drop, more dissolved matter adheres to them. All this forms part of the "marine snow" which has been often reported but never until now understood. The Yale University scientist who took part in the original discovery is continuing his studies of organic particulate

matter with emphasis on deep-sea studies. Many of the processes involved in the formation of organic aggregates and their relation to the marine community as a whole are not yet well understood. Further research should better illuminate these processes and their significance.

A further sidelight of research into the nature of organic particulate matter and its formation in the sea is a theory proposed by another marine biologist at Yale University. By bubbling a mixture of artificial sea water containing inorganic and organic compounds in solution, he found that the organic compounds could be concentrated on bubbles. Further bubbling may cause these compounds to form more complex organic molecules, he said.

He believes that this mechanism of adsorption by bubbling may have been an important step in the long process of evolution from inorganic chemicals to life in the sea. "Even if life did not trace its ancestry back to air bubbles in the sea," he said, "it seems certain that if a stable marine food supply created from a vast reservoir of dissolved organic matter did not exist, there would be less life today and fewer stable forms. Probably most deep-sea life would be nonexistent since organic particulate matter appears to be their basic food source." (National Science Foundation, October 5, 1964, and Science News Letter, October 17, 1964.)

COAST AND GEODETIC SURVEY VESSELS CHART AND SURVEY THE OCEAN:

Fifteen vessels of the U. S. Coast and Geodetic Survey will travel more than 130,000 miles in the Atlantic, Pacific, and Gulf of Mexico during the 1965 marine survey season extending from February to October. The vessels range in size from the 66-foot Wainwright and Hilgard to the 303-foot Oceanographer.

The Hydrographer, Bowie, and smaller vessels like the Marmer will nose their way up and down such bodies of water as Long Island Sound, the Straits of Florida, and Puget Sound. The two small wire-drag vessels, the Wainwright and Hilgard, which work together, will probe the waters off Florida and the Gulf Coast for undersea hazards to navigation, such as sunken wrecks and jutting rocks. The larger ocean survey vessels, such as the Pio-

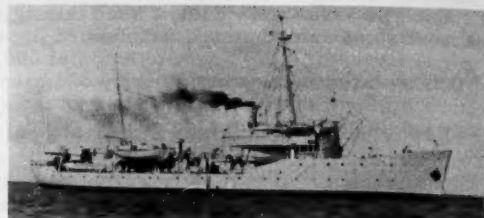


Fig. 1 - The Pathfinder, one of the larger ocean survey vessels.

neer, Pathfinder, Surveyor, and Oceanographer, will work the deep ocean.

Other vessels in the fleet include the Explorer, Hodgson, Lester Jones, Patton, Peirce, and Whiting. The vessels depart from Seattle, Wash.; Oakland, Calif.; St. Petersburg, Fla.; Savannah, Ga.; and Norfolk, Va.

Twelve of the vessels have the exacting task of revising or updating coastal chart information. In order to find the safest routes for mariners, the vessels will determine changes in charted land features and the shoreline, shifting of sand bars and shoals, and changes in depth and currents in navigable channels.

On a broader scale, the remaining vessels will explore offshore waters and collect systematic oceanographic data. From such information, scientists hope to develop basic maps of the topography of the ocean floor; the gravitational and magnetic fields; the temperature, salinity, and chemical properties of the water; the movement of ocean currents; and the ocean's surface conditions and weather. Such information is necessary for the further development of the ocean's resources.

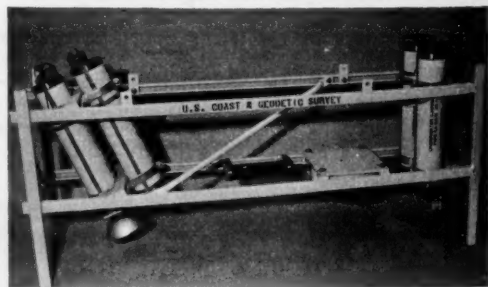


Fig. 2 - "Stereo" deep-sea camera used by U.S. Coast and Geodetic Survey to photograph in color sea life at 2,000 feet and bottom formations at more than 7,000 feet.

The Coast and Geodetic Survey is the Government's chief civilian oceanographic agency. It also oversees the operation of a worldwide network of seismographs which, when completed, will include 125 stations in 63 countries and may some day provide the basis for an advance earthquake warning system. It operates the Pacific Seismic Sea Wave Warning System, a network of some 60 tide stations which alerts people along the Pacific when destructive seismic waves may strike. The agency also provides geodetic, geophysical, photogrammetric, and cartographic data for charting and scientific purposes and for defense needs. It produces and distributes approximately 30 million aeronautical and nautical charts each year and does extensive work in research and development. (U. S. Coast and Geodetic Survey, February 21, 1965.)

MIAMI CONFERENCE ON RESEARCH VESSELS:

A conference on research vessels and their operation was held February 9-11, 1965, at the Institute of Marine Science, University of Miami. It was attended by representatives of leading oceanographic institutions.

During the meetings, oceanographers and ship operators discussed such matters as the development of new designs for research vessels, pending legislation in Congress involving the operation of research vessels, and problems of labor and recruitment. An engineering symposium was also held.

Institutions represented at the conference included the Woods Hole Oceanographic Institution, Scripps Institution of Oceanography, Lamont Geological Observatory of Columbia University, University of Oregon, University of Washington, University of Hawaii, Duke University, Hopkins Marine Station of Stanford University, University of Alaska, University of Rhode Island, Texas A & M University, University of Michigan, Chesapeake Bay Institute of Johns Hopkins University, and the University of Miami. Representatives were also present from U. S. Office of Naval Research and the Navy's Bureau of Ships. (University of Miami, February 12, 1965.)

NEW STUDY ON SURFACE CURRENTS OFF ATLANTIC COAST:

A new study of surface currents in the waters off the Atlantic coasts of the United States and Canada will help shed more light on such problems as the disposal of atomic waste materials, shore pollution, and the migration of fish, according to the American Geographical Society.

In a series of minutely detailed charts, the study describes and maps the paths presumably taken by thousands of "drift bottles" dropped into the offshore waters over the Continental Shelf and allowed to float ashore. More than 156,000 drift bottles have been released by various American and Canadian research groups during the 14 years between 1948 and 1962. They were dropped from research vessels, ferries, aircraft, and "Texas Towers," along the coasts from Newfoundland to Florida. Ten percent of the bottles released were found on the North American seaboard, although many more might have drifted ashore without being discovered. Two percent of the total, swept along by the Gulf Stream and its branches, were found overseas.

Each of the drift bottles contained a self-addressed return postcard asking the finder to note on it the date and location in return for a small reward. The Woods Hole Oceanographic Institution, which has maintained a log of all bottles released and recovered by its own as well as by cooperating investigators, coordinated the drift-bottle data.

The study is said to be the most comprehensive of its kind ever made and is the work of two oceanographers--one a Senior Scientist at the Woods Hole Oceanographic Institution and the other a scientist of the Fisheries Research Board of Canada. Published as Folio 7 of the American Geographical Society's "Serial Atlas of the Marine Environment," the study includes 12 charts, one for each month of the year. The charts show where drift bottles were released, the percentage washed ashore and recovered, and the direction and speed in miles per day, of the surface drift. Four other maps show the circulation pattern by seasons.

The American Geographical Society, New York, N. Y., began publication of the Serial Atlas in 1962, specifically as a research tool by means of which important oceanographic data could be made generally available.

Another purpose was to speed interdisciplinary communication. Each folio of the Atlas studies some aspect of the marine environment--biological, geological, physical, or chemical. Maps are printed on translucent paper, in both bound- and loose-leaf editions. The loose-leaf form permits any one of the separate map plates to be placed on a light-table in register with plates on the same scale in other folios so that comparative studies can be made more easily.



Oregon

LARGE-SCALE SALMON PLANTING IN THE WILLAMETTE RIVER:

A big effort is under way to set up a fall chinook salmon run in the Willamette River in Oregon. Plans call for Federal and State hatcheries to release about 11 million young fall chinook salmon in the Willamette during early 1965.

A key factor in the project is the proposed modern fishway at Willamette Falls. The Willamette River apparently has never had many fall chinook salmon because their upstream migration occurs when low water makes Willamette Falls all but impassable. The old fish ladder there has been of little value. The proposed new ladder would let adult salmon get over the falls at all but extremely high river flows. Subject to the availability of Federal funds, the new fishway is tentatively scheduled for completion in the summer of 1966.

The planting of fall chinook salmon in the Willamette is being carried out under the Columbia River Fishery Development Program of the U. S. Fish and Wildlife Service in cooperation with State fish and game agencies of Oregon and Washington.

The Washington State hatchery at Skamania is rearing and will release 2.5 million young chinook in the Willamette system. The Oregon State hatchery on Gnat Creek is rearing and will release about 1 million. Eagle Creek National Fish Hatchery in Oregon will put 1.5 million young chinook into the Willamette's tributaries and Spring Creek National Fish Hatchery in Washington will contribute 2 million.

In addition, the Oregon Fish Commission will release about 4 million young fall chinook fingerlings above Willamette Falls. Those fingerlings are surplus stock from hatcheries which were filled to capacity by the millions of eggs taken from the Columbia River salmon run in 1964.

The Willamette River system offers a great untapped area in the Columbia Basin for the development of a fall chinook salmon run.



Oysters

NEW METHOD OF PREPARING FOR SHUCKING:

A firm in New Orleans, La., has developed a new method of preparing oysters for shucking. The new method causes the oysters to gape, allowing easy removal from the shell. It also results in a thorough cleaning of the shellstock, a factor which has impressed health officials who have observed the operation.



Rhode Island

ONE-DAY FISHERMEN'S FORUM HELD:

The University of Rhode Island held a one-day Fishermen's Forum on its campus on March 6, 1965, to provide working fishermen with information on new types of trawls, electronic fish-finding equipment, refrigerated sea-water storage, and experimental government fishing efforts.

Sponsored by the Marine Resources Program of the University of Rhode Island in cooperation with the Pt. Judith (R. I.) Fishermen's Cooperative, the activities were planned by the University's faculty members with the help of a five-member committee of fishing vessel captains and crew members. "They actually told us what topics they were interested in having tackled at that Forum. Most of the agenda is an outcome of meetings and discussions with them," an associate professor of food and resource economics explained. In addition to a series of speakers, the agenda included films, slides, and question-and-answer periods.

The fourth in a series that began in 1961, the Forum was open to the public. A staff member of the Vessel and Gear Section, Industrial Development Service, Canadian Department of Fisheries, discussed the "New-foundland Trawl." The assistant chief of the Branch of Exploratory Fishing, U. S. Bureau of Commercial Fisheries showed a film about the "Midwater Trawl," which was used successfully at varying depths off the bottom in European waters and experimentally on the United States west coast. (Species such as hake, whiting, and butterfish--frequently found in midwater depths--may not be caught by fishermen relying on the otter trawl which is dragged along the bottom.) The director of the Bureau's Technological Laboratory, Gloucester, Mass., discussed the technical aspects of "Refrigerated Sea Water Storage" aboard fishing vessels. (This method of preserving fish--as opposed to ice--holds promise of cutting down on fish damage and of increasing the ease of handling and unloading.)

The morning and afternoon sessions concluded with one-hour discussion periods. The speakers rotated through each conference room to answer questions. The afternoon program had as its theme: "New Developments in Fish-Finding Equipment." An electronic technician from the Bureau's Biological Laboratory, Woods Hole, Mass., outlined general developments in the last few years in the electronics field. The captain of the Bureau's research vessel *Albatross IV*, which is based at Woods Hole, illustrated his talk on "The Experience with *Albatross IV* as Seen from the Fisherman's Point of View," with a film. (Press Release of University of Rhode Island.)



Salmon

U. S. PACIFIC COAST CANNED STOCKS, FEBRUARY 1, 1965:

On February 1, 1965, canners' stocks in the United States of Pacific canned salmon totaled 2,477,961 standard cases (48 1-lb. cans), 371,893 cases less than on January 1, 1965, when the pack was 290,200 cases less than on December 1, 1964.

On the basis of a total of 2,936,600 actual cases (consisting of cans of $\frac{1}{4}$ -lb., $\frac{1}{2}$ -lb., 1-lb., etc.), pink salmon make up 52.8 percent (1,550,541 cases, mostly 1-lb. talls) of the to-



Cases of canned salmon on pallets are transported from Alaska vessel into Seattle warehouse on forklift trucks. Palletization is speeding up the transportation of canned salmon.

tal canners' stocks on February 1, 1965. Next came chum (648,041 cases, mostly 1-lb. talls), followed by red (511,299 cases). The remainder of about 7.7 percent was coho (silver) and king salmon. About 80 percent of the pink salmon stocks on hand was packed in 48 1-lb. cans, and the balance mostly in 48 $\frac{1}{2}$ -lb. cans.

Table 1 - Total Canners' Stocks of Pacific Salmon, February 1, 1965, with Comparisons

Species	Feb. 1, 1965	Jan. 1, 1965	Dec. 1, 1964
. (No. of Actual Cases)			
King	79,834	91,675	94,648
Red	511,299	607,913	674,711
Coho	146,885	176,504	222,095
Pink	1,550,541	1,795,619	1,977,112
Chum	648,041	726,063	782,844
Total	2,936,600	3,397,774	3,751,410

From January 1 to February 1, 1965, pink salmon stocks were lower by 245,078 actual cases (1-lb. talls lower by 189,519 cases), reds were down 96,614 cases, and chums were down 78,022 cases.

Carryover stocks at the canners' level totaled 1,175,588 standard cases on July 1, 1964, the approximate opening date of the Pacific salmon packing season. Adding the new sea-

Table 2 - Total Cannery Stocks on Hand February 1, 1965 (Sold and Unsold), By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
48 $\frac{1}{4}$ -lb.	7,453	89,748	44,585	5,155	1,150	148,091
48 $\frac{1}{2}$ -lb.	65,590	256,487	24,803	266,361	81,900	695,141
48 1-lb.	6,689	164,917	68,483	1,251,034	546,190	2,037,313
12 4-lb.	102	147	9,014	27,991	18,801	56,055
Total	79,834	511,299	146,885	1,550,541	648,041	2,936,600

Table 3 - Cannery Shipments from July 1, 1964, to February 1, 1965, By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
48 $\frac{1}{4}$ -lb.	16,794	338,184	78,107	6,526	294	439,905
48 $\frac{1}{2}$ -lb.	71,252	430,607	29,572	337,107	76,191	944,729
48 1-lb.	15,432	333,137	100,026	1,146,890	332,417	1,927,902
12 4-lb.	314	4,803	12,476	71,406	20,741	109,740
Total	103,792	1,106,731	220,181	1,561,929	429,643	3,422,276

son pack of 3,922,356 standard cases brought the total available supply for the 1964/54 season to 5,097,944 standard cases.

Shipments at the cannery level from July 1, 1964, to February 1, 1965, totaled 3,422,276 actual cases (equal to 2,619,983 standard cases). Shipments during January 1965 totaled 371,893 standard cases of which 189,519 cases were pink salmon in 1-lb. talls.

Data on canned salmon stocks are based on reports from U. S. Pacific Coast canners who packed over 97 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Canners Association, February 25, 1965.)



Shark

TAGGING PROJECT IN EASTERN PACIFIC RELATED TO SHARK CONTROL WORK:

In late 1964, some 560 sharks were tagged along the Pacific coast of Mexico by biologists of the U. S. Bureau of Commercial Fisheries Tuna Resources Laboratory, La Jolla, Calif. Concern over shark damage to tuna purse-seine nets is the main reason for the Bureau's interest in shark. The tagging was done to learn more about their growth and migration. Such knowledge can aid efforts to control the "net-eating" shark which plague tuna fishermen.

The shark-tagging work off Mexico was done from the chartered vessel Red Rooster during a 60-day cruise which ended December 30, 1964. During cruise, 35 tagged shark

were recaptured including 3 previously tagged in June 1964 and 1 tagged in August 1962. The cruise was sponsored by the Shark Research Panel of the American Institute of Biological Sciences and the U. S. Office of Naval Research, who also want to learn more about the life history of sharks, of which so little is known. Including previous tagging conducted from the purse-seine vessels Royal Pacific and West Point in 1962, a total of about 1,000 tagged shark have been released in the eastern tropical Pacific. The areas of tagging are shown in figure 1 (see page 35).

It is essential that more of the tagged shark be recaptured in order to gain information about their movements. Fishermen can greatly aid this work by reporting all tagged shark recaptured in the Pacific.

Four different types of tags, pictured in figure 2, have been used. Recovered tags, along with information on date and place of capture, should be forwarded to the U. S. Bureau of Commercial Fisheries, La Jolla, Calif., or turned over to representatives of any fishery research agency in San Pedro

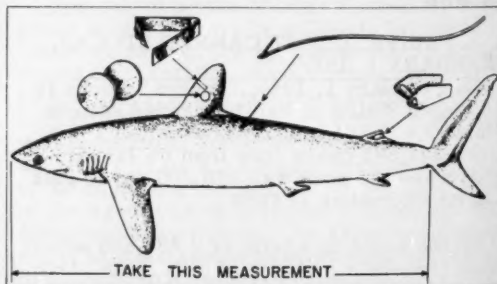


Fig. 2 - Types of shark tags. Tags are, left to right: Petersen disc, cattle, dart, and sheep.



Fig. 1 - Tagging areas. Shaded areas show where tagged sharks have been released.

or San Diego, Calif. A nominal reward of \$1 will be paid to those returning tags. It would be helpful, additionally, if the tagged shark were measured (from tip of snout to base of tail), or if the entire shark were frozen and brought to port for pick-up by the Bureau of Commercial Fisheries.

Ways of controlling shark attacks on fishing nets are being sought. Chemical "repellents" have not proved to be effective. Another approach to shark control is to reduce their number. The histories of the now-defunct soupfin shark fishery in California and the present shark fishery in Australia have shown that populations of shark can be reduced significantly in a surprisingly short period of time. In fact, both California and Australia had to resort to protective meas-

ures in order to maintain their shark fisheries. In Hawaii, a year-long shark eradication program conducted in 1959-1960 resulted in a fast decline of coastal shark. Just how quickly shark populations can be reduced in particular areas by fishing depends on how widespread their movements are. Learning more about such movements is a major objective of the present shark-tagging program.

The Mexican shark fishery has recently undergone rapid growth. Shark fishing centers are now located from Guaymas to Salina Cruz. The fishery is coastal, and for the most part depends on shark that are not associated with tuna schools. However, the increasing growth of the fishery will probably lead to an expansion of the fishery to include shark in offshore waters. The fishery at Las

Tres Marias, for example, has expanded from coastal gill-netting to high-seas long-lining. The most abundant shark in that fishery is the "net-eater" which is responsible for most of the attacks on purse seines. The continuing expansion of the Mexican shark fishery may prove to be beneficial to U. S. tuna fishermen.

In Mexico, shark meat is eaten fresh or as "bacalao" (salted and dried fillet). The liver and waste products are also used, the latter for fertilizer. Hides are exported to the United States where high-grade leather is made from them. Fins are shipped to the Orient. In the United States, the market for shark meat is restricted to only a few species. However, the Bureau of Commercial Fisheries has received inquiries requesting names of suppliers of dried shark fins for export to Hong Kong. The price offered is about \$1 a pound for dried fins of acceptable quality. One buyer reportedly can handle 10,000 to 20,000 pounds of shark fins per month. Interested fishermen are invited to contact the Director, Tuna Resources Laboratory, U. S. Bureau of Commercial Fisheries, P. O. Box 271, La Jolla, Calif., for further information.

Note: See *Commercial Fisheries Review*, Aug. 1964 p. 78, July 1964 p. 61, Dec. 1962 p. 50.



Shellfish

7TH ANNUAL SHELLFISH MORTALITY CONFERENCE HELD:

The 7th Annual Shellfish Mortality Conference, sponsored by the Virginia Institute of Marine Science, was held at Gloucester Point, Va., January 25-26, 1965. About 50 scientists from Atlantic and Gulf Coastal States and from Canada attended the Conference to discuss problems relating to shellfish mortalities and to report progress made. The subjects presented ranged from the composition of oyster blood through the various forms of MSX to the progress made in breeding oysters resistant to disease.

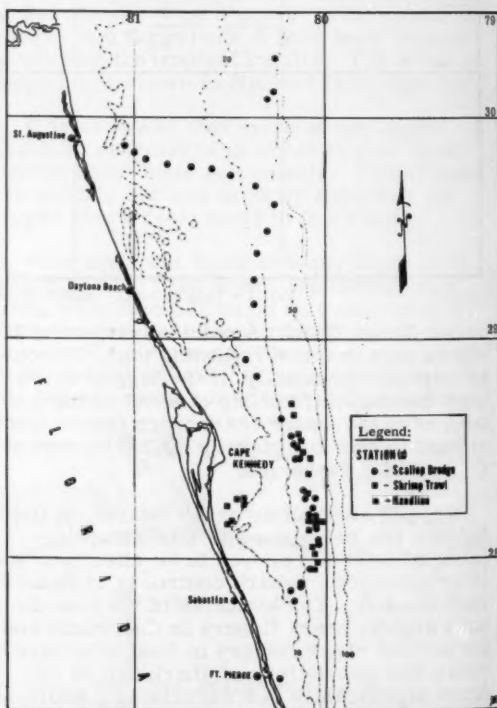
Research done at universities and state and Federal-conducted laboratories will eventually result in growing oysters and other bivalves scientifically. This will lead to less dependence on wild oysters and their fluctuations in abundance, which is a major problem of shellfish producers. (Virginia Institute of Marine Science, Gloucester Point, Va.)



South Atlantic Fisheries Explorations and Gear Development

CALICO SCALLOP PROCESSING EQUIPMENT TESTED ABOARD VESSEL AT SEA:

M/V "Oregon" Cruise 97 (January 11-22, 1965): Cooperative Bureau-industry tests of recently developed calico scallop (*Pecten gibbus*) processing machinery were undertaken aboard the Bureau of Commercial Fisheries exploratory fishing vessel Oregon during recent shellfish explorations in order to evaluate the feasibility of processing this species at sea. During the cruise, the vessel operated off the Florida east coast on scallop grounds located during earlier Bureau work. The more important aspects of the tests centered around modifications to and the operation of scallop-eviscerating equipment employing a completely new principle. Observations showed that the eviscerator functioned well, and the developers of the equipment indicate they hope to have it ready for commercial application in the near future.



Area investigated off Florida's east coast during Cruise 97 of the M/V Oregon (January 11-22, 1965).

Forty-six 30-minute drags with 6- and 8-foot tumbler dredges yielded catches of calico scallops ranging from 0 to 20 bushels per drag. Most were medium scallops (45-50 millimeters or 1.8 to 2.0 inches in width) which yielded 112 to 142 meats per pint (one pound). Commercial concentrations of scallops were located in 28 fathoms off Cape Kennedy.

Large brown shrimp (*Penaeus aztecus*) were located off the Florida east coast in a depth of 30 to 32 fathoms. Although trawling was limited to 24 drags, bottom conditions suitable for shrimp trawling were found in depths ranging from 26 to 43 fathoms between Bethel Shoal and Cape Kennedy (27° 57' to 28° 42' north latitude). Shrimp catches ranged from 0 to 25 pounds (heads-on) of 16-20 count brown shrimp per hour with a 40-foot flat trawl fished on 6-foot chain doors. Fish catches in the area ranged from 30 to 832 pounds per drag, mostly croaker (*Micropogon undulatus*), spot (*Leiostomus xanthurus*), pinfish (*Lagodon rhomboides*), filefish (*Stephanolepis hispidus*), and kingfish (*Menticirrhus* sp.).

Hand lines, fished at three stations, yielded catches of mixed bottom and near-bottom fish species. Specimens collected from trawls, dredges, and nekton and plankton nets were preserved for cooperative studies with other U. S. Bureau of Commercial Fisheries laboratories.

Note: See Commercial Fisheries Review, June 1964 p. 27.



States Legislation

ACTIONS AFFECTING FISHERIES:

Following is a list of proposed State Legislative actions affecting fisheries. The bills listed are those introduced during the current session of the various State Legislatures. (Information Letter, National Canners Association, February 20, 1965.)

Alaska: H. 76 would create a division of seafood research within the Alaska Department of Economic Development.

H. 109 relates to the payment of debts incurred by fish and marine products buyers.

S. 19 would require the processor or fish buyer to furnish information concerning per-

sons from whom he purchased fish; would be retroactive to January 1, 1965.

S. 1 would require that a primary buyer "shall purchase raw fish by the pound."

S. 33 specifies that in arriving at a wholesale price relative to fisheries taxes, the discount allowed for cash would be increased from 1½ to 2 percent.

S. 34 would levy an annual license tax on crab bought or obtained for processing by any method, of 2 percent of the value of the raw crab.

Oregon: S. 235 relates to the control of commercial fishing. It would provide for the licensing and bonding of commercial fishing and canning operations.

Maine: H. 94 relates to a license for sardine packers.

H. 95 would repeal the law regulating the canning of herring.

S. 293 would repeal the Fish Packing Wage Board law.

H. 898 relates to the merchandising of Maine sardines.

H. 848 relates to the repeal of the sardine tax on exports.

Massachusetts: H. 2170 would provide for a study to determine the need for licensing the importation of certain lobsters.

H. 1006 relates to the importation of shellfish for consumption as food.

H. 249 relates to a study of certain marine matters and the financing of a fisheries fund through certain industries such as processing plants.

H. 391 relates to the sale of certain cooked lobsters.

H. 410 would authorize the Massachusetts Department of Public Health to make rules and regulations for the packaging of food.

H. 30 would further regulate the identity and quantity of commodities in packaged form.

H. 3048 would further define the laws relative to the licensing of dealers in fish and shellfish.

H. 3207 would regulate the unloading of fish for human consumption.

H. 253 relates to permits and certificates issued by the Massachusetts Division of Marine Fisheries.

H. 1402 would provide for annual examinations of certain persons engaged in the business of handling food.

S. 444 would remove restrictions on the sale of scallops not in the shell or of soaked scallops.

S. 447 would further regulate the sale, transportation, and possession of lobster meat.

S. 448 pertains to the legal length of lobsters.

S. 111 would establish a wholesale market authority.

S. 450 relates to the development of the commercial fishing industry.

New York: A 1243 relates to labeling. The bill says that no manufacturer, processor, canner, bottler, packer, wholesaler, retailer, or other distributor shall sell or offer sale for consumption in the state, any container having canned, bottled, dehydrated, frozen, or processed food articles unless the containers are labeled indicating the grade or quality of articles and certain other information.

Maryland: H. 32 would require the licensing of oyster buyers and certain oyster bay boats, vessels, and vehicles.

Arkansas: S. 32 would require all fresh, chilled, packaged, processed, or frozen meats which are produced in foreign countries and imported into this country to be labeled as foreign goods with the exception of seafoods.

Minnesota: H. 602 would permit regulations including standards of net weight, measure, or count and prohibit packages made, formed, or filled so as to deliberately and intentionally deceive the purchaser as to the quantity of contents of the package.



United States Fisheries

VALUE OF COMMERCIAL FISHERY LANDINGS HIGHER IN 1964:

United States landings of fish and shellfish dropped sharply in 1964, but because of higher prices for several species and increased landings of some higher-priced species, commercial fishermen received slightly more than in 1963.



Fig. 1 - Unloading frozen tuna from a California purse-seiner.

Preliminary data show that the 1964 landings of 4.4 billion pounds were about 9 percent below landings of a year earlier, or down about 447 million pounds.

During the past 5 years, United States fishermen have received about \$367 million annually for their catch. Imported fishery products during the same period had an average annual value of some \$420 million. Consumers spend about \$2 billion annually for fishery products, 60 percent of that amount being spent for fishery products of domestic origin.

For the second consecutive year, the United States imported more than 60 percent of the fishery products used. Major imports were fish meal, tuna, frozen fillets, shrimp, sardines, and lobsters.

The 1964 landings of industrial fish, principally menhaden, accounted for about 336 million pounds of the decrease, with heaviest losses in menhaden occurring in the Middle Atlantic fishery. The total 1964 catch of food fish was down about 100 million pounds, according to preliminary data.

The most important increase in the 1964 landings was in the estimated salmon catch



Fig. 2 - Gill-net boat in Alaska with a load of red salmon.

in Alaska of about 312 million pounds--an increase of 89 million pounds, or 40 percent more than in 1963. The Alaska catch was up for all salmon species, with red, pink, and chum salmon accounting for most of the gain. But the salmon catch in the State of Washington was down nearly 34 million pounds--mostly pink salmon. The decrease is not considered unusual because few pink salmon enter Puget Sound waters in even-numbered years. Pink salmon there have a 2-year reproduction cycle, and so far all attempts to change that cycle have failed. There also was a drop of several million pounds in the red salmon catch in Puget Sound waters.

Landings of other species which increased in 1964 included Alaskan king crab and Alaskan herring, as well as haddock from the New England fishery. The Maine herring fishery had the largest decline in the United States food fish catch. Only 61 million pounds were caught in 1964--a drop of 93 million pounds or 60 percent lower compared with 1963. Shrimp landings along the South Atlantic and Gulf States in 1964 were down about 26 million pounds or 11 percent below the 1963 landings.

The United States continued to rank fifth among leading fishing countries of the world--trailing Peru, Japan, Communist China, and the Soviet Union in that order. Peru replaced Japan as world leader in total fishery landings in 1962 with a spectacular increase in the catch of industrial fish (anchoveta) used primarily for fish meal. Peru's total fishery landings in 1964 were more than 200

United States Commercial Fishery Landings of Principal Species, 1964 and 1963		
Species	1/1964	1963
	.. (1,000 Lbs.) ..	
Fish:		
cod	41,800	48,546
flounders	173,200	176,798
haddock	133,200	123,972
hake, white	6,700	6,249
halibut	35,300	45,841
herring, sea:		
Atlantic	61,400	154,770
Pacific	53,900	38,834
mackerel, Calif.:		
jack	88,900	95,442
Pacific	24,900	40,243
menhaden	1,480,000	1,815,798
ocean perch, Atl.	88,000	108,292
pollock	13,700	14,607
salmon	350,300	294,177
sardine, Pacific	10,500	7,131
tuna:		
albacore	41,100	60,802
bluefin	30,300	41,313
little	60	72
skipjack	77,100	108,997
yellowfin	149,900	110,424
unclassified	-	11
Total tuna	298,460	321,619
Shellfish:		
clams	66,000	63,669
crabs	256,600	252,334
lobster, northern	29,800	30,274
oysters	58,100	58,444
scallops, sea	16,600	19,939
shrimp	214,600	240,473
Total all above items	3,501,960	3,957,452
Other	898,040	889,923
Grand total	4,400,000	4,847,375
1/Preliminary.		

times what they were in 1947, and more than 47 times the landings of 10 years ago.

Note: See *Commercial Fisheries Review*, February 1965 p. 41; May 1964 p. 34.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED:

October 1964: During October 1964, a total of 36 vessels of 5 net tons and over was issued first documents as fishing craft, the same as in October 1963. There were 39 documents cancelled for fishing vessels in October 1964, as compared with 28 in October 1963.

Table 1 - U. S. Fishing Vessels 1/-Documentations Issued and Cancelled, by Areas, October 1964 with Comparisons

Area (Home Port)	October		Jan.-Oct.		Total 1963
	1964	1963	1964	1963	
	(Number)				
Issued first documents 2/:					
New England	3	2	29	20	23
Middle Atlantic	1	-	9	16	18
Chesapeake	9	9	36	54	66
South Atlantic	3	6	39	65	77
Gulf	11	15	194	209	239
Pacific	7	4	130	150	160
Great Lakes	1	-	2	4	5
Hawaii	-	-	1	-	-
Puerto Rico	1	-	2	2	2
Total	36	36	442	520	590
Removed from documentation 3/:					
New England	7	3	36	41	48
Middle Atlantic	5	-	19	42	47
Chesapeake	4	3	19	19	25
South Atlantic	12	2	39	47	53
Gulf	6	13	32	100	118
Pacific	5	7	112	75	87
Great Lakes	-	-	9	13	15
Hawaii	-	-	-	3	3
Total	39	28	296	340	396

Note: For explanation of footnotes, see table 4.

Table 2 - U. S. Fishing Vessels--Documents Issued by Vessel Length and Area, October 1964 2/

Length in feet	New England	Middle Atlantic	Chesa- peake	South Atlantic	Gulf	Pacific	Great Lakes	Puerto Rico	Total
	(Number)								
27	-	-	-	-	-	-	-	-	1
28	-	-	-	-	1	-	-	-	1
29	-	-	-	-	-	1	-	-	1
31	-	-	-	-	-	-	-	-	1
32	-	-	1	-	-	-	-	-	2
33	-	-	-	-	1	-	-	-	1
36	-	-	-	-	-	1	-	-	1
37	-	-	3	-	1	-	-	-	4
38	-	-	2	-	-	-	-	-	2
39	-	-	1	-	-	-	-	-	1
40	1	-	1	-	-	-	-	-	2
49	-	-	-	-	-	1	-	-	1
50	-	-	-	-	-	1	-	-	1
53	-	-	-	1	-	-	-	-	1
55	-	-	-	-	-	1	-	-	1
56	-	-	-	-	-	1	-	-	1
61	-	-	-	1	-	-	-	-	1
64	-	-	-	-	1	-	-	1	3
65	-	-	-	-	-	1	-	-	1
66	-	-	-	1	-	-	-	-	2
68	-	-	-	-	1	-	-	-	1
72	1	-	-	-	-	-	-	-	1
73	1	-	-	-	-	-	-	-	1
74	-	1	-	-	-	-	-	-	1
148	-	-	-	-	-	1	-	-	1
152	-	-	1	-	-	1	-	-	2
Total	3	1	9	3	11	7	1	1	36

Note: For explanation of footnotes, see table 4.

Table 3 - U. S. Fishing Vessels--Documents Issued by Tonnage and Area, October 1964 2/

Gross Tonnage	New England	Middle Atlantic	Chesa- peake	South Atlantic	Gulf	Pacific	Great Lakes	Puerto Rico	Total
	(Number)								
5-9	-	-	8	-	1	1	-	-	10
10-19	1	-	-	-	3	2	1	-	7
30-39	-	-	-	-	-	1	-	-	1
40-49	-	-	-	2	-	-	-	1	3
50-59	-	-	-	-	2	1	-	-	3
70-79	-	1	-	-	-	-	-	-	1
80-89	-	-	-	1	2	-	-	-	3
100-109	1	-	-	-	1	-	-	-	2
110-119	1	-	-	-	-	-	-	-	1
360-369	-	-	-	-	-	1	-	-	1
450-459	-	-	1	-	-	-	-	-	1
490-499	-	-	-	-	-	1	-	-	1
Total	3	1	9	3	11	7	1	1	36

Note: For explanation of footnotes, see table 4.

Table 4 - U. S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, October 1964 2/

Horse- power	New England	Middle Atlantic	Chesa- peake	South Atlantic	Gulf	Pacific	Great Lakes	Puerto Rico	Total
	(Number)								
60	-	-	-	-	-	1	-	-	1
85	-	-	-	-	-	1	-	-	1
100-109	1	-	1	-	-	1	-	-	3
120-129	-	-	1	-	-	1	-	-	2
130	-	-	-	-	1	1	-	-	2
145	-	-	1	-	-	1	-	-	1
160-169	-	-	1	2	-	-	-	-	3
170	-	-	-	-	1	-	1	-	2
200	-	-	-	-	-	-	-	1	1
210	-	-	3	-	-	-	-	-	3
220	-	-	-	-	2	2	-	-	4
230	-	-	-	-	1	-	-	-	1
250	-	-	-	-	-	-	-	-	1
300	-	-	1	1	3	-	-	-	5
390	-	1	-	-	-	-	-	-	1
457	1	-	-	-	-	-	-	-	1
510	-	-	-	-	-	-	-	-	1
600	-	-	-	-	-	1	-	-	1
1530	-	-	1	-	-	1	-	-	1
1800	-	-	-	-	-	1	-	-	1
Total	3	1	9	3	11	7	1	1	36

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
 2/There was 1 undocumented vessel in October 1964 previously removed from the records. Vessels listed first document as fishing craft were built: 25 in 1964; 1 in 1962; 1 in 1958; 1 in 1950; and 5 prior to 1949.
 3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
 Source: Monthly Statements to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U. S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-30, 1965, amounted to 3,540,035 pounds (about 168,573 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the 12½-percent rate of duty has not been announced; however, in 1964 the quota was 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Imports in excess of the quota were dutiable at 25 percent ad valorem, but total imports were below the quota in 1964.

Note: See Commercial Fisheries Review, March 1964 p. 55.

AIRBORNE IMPORTS OF FISHERY PRODUCTS, NOVEMBER 1964:

Airborne fishery imports into the United States in November 1964 consisted mainly of shrimp from Venezuela and Panama. Shipments were about the same as in the previous month.

Airborne shrimp imports in November 1964 totaled 700,900 pounds, the bulk of which was fresh and frozen raw headless shrimp. Al-

U. S. 1/Airborne Imports of Fishery Products,
January-November 1964 with Comparative Data

Product and Origin 2/	1964		1964		1963	
	November		Jan.-Nov.		Jan.-Nov.	
	Qty./3/	Value4/	Qty./3/	Value4/	Qty./3/	Value4/
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
Fish:						
Mexico	-	-	320.5	64.7	264.8	70.0
Canada	-	-	14.8	4.8	-	-
Other countries	51.9	23.2	82.7	60.9	108.0	120.1
Total fish	51.9	23.2	418.0	130.4	372.8	190.1
Shrimp:						
Guatemala	-	-	-	-	141.6	74.0
El Salvador	11.1	6.0	170.2	102.8	297.7	190.2
Honduras	-	-	10.3	3.8	89.8	52.3
Nicaragua	9.7	5.5	97.5	55.8	505.0	174.6
Costa Rica	-	-	310.2	166.8	598.3	284.3
Panama	120.3	78.0	1,070.4	665.4	1,541.3	831.5
Venezuela	559.8	294.6	5,805.7	2,799.5	4,500.5	2,096.8
Ecuador	-	-	-	-	111.6	39.4
France	-	-	-	-	2.6	0.9
British Guiana	-	-	10.5	5.2	-	-
Mexico	-	-	2.1	1.4	13.2	6.9
Other countries	-	-	13.1	6.9	7.9	8.6
Total shrimp	700.9	385.1	7,490.0	3,807.6	7,819.5	3,759.5
Shellfish other than shrimp:						
Canada	2.8	1.3	315.7	174.7	213.3	109.2
Mexico	-	-	14.4	9.9	101.1	60.8
British Honduras	48.9	54.2	302.6	258.1	344.5	281.8
Honduras	-	-	80.3	82.6	17.0	7.0
Nicaragua	-	-	50.5	40.0	164.5	100.0
Costa Rica	-	-	19.1	14.7	73.8	60.1
Jamaica	-	-	63.3	63.2	66.5	50.2
Other countries	50.1	56.4	108.6	82.2	117.3	103.9
Total	101.8	111.9	954.5	725.4	1,098.0	773.0
Grand total	854.6	520.3	8,862.5	4,663.4	9,290.3	4,722.6

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.

2/When the country of origin is not known, the country of shipment is shown.

3/Ones weight of shipments, including the weight of containers, wrappings, crates, and moisture content.

4/Net weight, point of shipment. Does not include U.S. import duties, air freight, or insurance.

Note: These data are included in the overall import figures for total imports, i.e., these imports are not to be added to other import data published.

Source: United States Airborne General Imports of Merchandise, FT 380, November 1964, U.S. Bureau of the Census.

most all of the airborne shrimp imports in November 1964 entered through the Customs District of Florida.

Spiny lobsters from British Honduras were the main shellfish item other than shrimp imported by air in November 1964.

Total airborne fishery imports in January-November 1964 were down 5 percent in quantity but only 1 percent in value from those in the same period of 1963. Airborne shipments of shrimp were down from most Central and South American countries, with the exception of Venezuela.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, FEBRUARY 1965:

Prices for fresh and frozen fishery products in February 1965 were down 2.2 percent from the previous month. At 109.7 percent of the 1957-59 average, the February wholesale price index for edible fish and shellfish (fresh, frozen, canned) was higher by 0.6 percent as compared with the same month a year earlier.

The subgroup index for drawn, dressed, or whole finfish dropped 5.5 percent from January to February. A sharp drop in prices at Boston for ex-vessel large haddock (down 25.6 percent) was largely responsible. Also prices in February were slightly lower for frozen western dressed halibut and salmon, but higher for Great Lakes fresh fish. As compared with the same month in 1964, prices this February were sharply lower for haddock (down 38.1 percent) because of better supplies. As a result, the subgroup index this February was down 4.7 percent from a year earlier. But prices this February were substantially higher for halibut (up 30.0 percent) due to smaller stocks in cold storage as a result of the drop in the 1964 North Pacific halibut catch. Prices this February for other items in the subgroup also were up from those in the same month of 1964.



Fresh halibut on display at one of the stands, Fulton Fish Market, New York City.

From January to February, prices for fresh small haddock fillets at Boston dropped 21.7 percent and prices for shucked standard oys-

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, February 1965 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Feb. 1965	Jan. 1965	Feb. 1965	Jan. 1965	Dec. 1964	Feb. 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					109.7	112.1	109.5	109.0
<u>Fresh & Frozen Fishery Products:</u>					114.5	118.3	113.8	113.2
<u>Drawn, Dressed, or Whole Finfish:</u>					115.1	121.8	111.2	120.8
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.13	.17	99.2	133.3	99.5	160.2
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.40	.40	117.3	118.3	118.3	90.2
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.85	.85	118.8	119.1	115.6	116.0
Whitefish, L. Superior, drawn, fresh.	Chicago	lb.	.65	.61	96.3	90.3	76.1	85.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.80	.75	131.0	122.8	114.6	101.6
<u>Processed, Fresh (Fish & Shellfish):</u>					115.1	116.0	111.9	114.0
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.44	.56	105.6	134.8	109.3	140.8
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.97	.94	113.7	109.6	105.5	106.6
Oysters, shucked, standards	Norfolk	gal.	7.00	7.13	118.0	120.1	120.1	118.0
<u>Processed, Frozen (Fish & Shellfish):</u>					108.6	111.8	112.8	100.7
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.35	.37	88.7	92.5	92.5	98.9
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.39	.40	114.3	115.8	115.8	115.8
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.31	.31	108.7	106.9	105.2	114.0
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.91	.95	107.9	112.1	113.8	91.3
<u>Canned Fishery Products:</u>					101.8	101.8	102.2	102.0
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	21.00	21.00	91.5	91.5	92.6	94.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	103.3
Mackerel, jack, Calif., No.1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	6.25	6.25	105.9	105.9	105.9	103.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.00	10.00	128.3	128.3	128.3	116.5
1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.								

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

ters were slightly lower. But those lower prices were partly cancelled out by higher prices (up 3.7 percent) at New York City for South Atlantic fresh shrimp. The subgroup index for processed fresh fish and shellfish dropped only 0.8 percent from January to February. As compared with February 1964, the subgroup index this February was up 1.0 percent because of increased shrimp prices (up 6.7 percent) which practically offset (by 25 percent) lower prices for fresh haddock fillets.

From January to February 1965, prices were lower for most items in the processed frozen fish and shellfish subgroup and that index was down 2.9 percent. Although February prices at Chicago for frozen shrimp were down 3.7 percent from the previous

month, they were 18.2 percent higher than in February 1964. Prices also were down from the previous month for flounder and haddock fillets, but for ocean perch fillets they were higher. The February 1965 subgroup index at 108.6 percent of the 1957-59 average was 7.8 percent higher than in the same month of 1964 solely because of higher (18.2 percent) frozen shrimp prices.

Prices for all canned fishery products were unchanged from January to February 1965. Compared with the same month a year earlier, the index this February was down 0.2 percent. Prices this February for canned pink salmon were 3.5 percent lower and those for canned tuna were slightly lower than in February 1964. But prices for canned Maine sardines were 10.1 percent higher due to a drop in the 1964 season pack.





FOREIGN

International

ATLANTIC FISHERIES REGULATION

PLANS FOR NORTHEAST ATLANTIC FISHERIES (POLICING) CONFERENCE:

A Northeast Atlantic Fisheries (Policing) Conference is tentatively scheduled for the fall of 1965. A number of interested countries have been invited to send fisheries experts to London on April 6, 1965, to frame an agenda for the forthcoming conference. Invitations to the preliminary meeting in April were sent by the host country (Great Britain) to France, Germany, Italy, the Netherlands, Belgium, Denmark, Norway, Portugal, Sweden, Iceland, Ireland, Spain, the U.S.S.R., Poland, Canada, the United States, and Japan.

The British invitation stems from a resolution adopted at the European Fisheries Conference (held in London, December 1963 through March 1964) which called upon the United Kingdom to convene a conference to draw up rules for the policing of fishing in the Northeast Atlantic. (United States Embassy, London, February 5, 1965.)

INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES

15TH ANNUAL MEETING TO BE HELD AT HALIFAX:

The 15th Annual Meeting of the International Commission for the Northwest Atlantic Fisheries (ICNAF) will be held June 7-12, 1965, at Halifax, Nova Scotia (Canada), at the Nova Scotian Hotel.

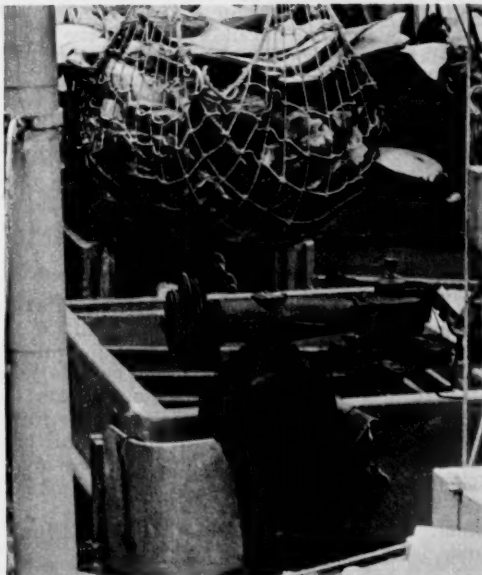
Various preliminary meetings will be held prior to the Annual Meeting. They are: (1) Fishery Assessment Subcommittee, May 28-29; (2) Herring and Other Pelagic Fish Subcommittee, May 29; (3) Research and Statistics Committee, May 31-June 4; (4) Scientific Advisers to Panels, June 5.

Note: See Commercial Fisheries Review, August 1964 p. 49.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

NORTH PACIFIC HALIBUT REGULATIONS FOR 1965:

Fishing for halibut will begin May 1, 1965, at 6 p.m. for the most important North Pacific areas (Areas 1, 2, and 3A), except in the Bering Sea (Areas 3B Northeast, 3B Northwest, and Area 3B North Triangle), and waters west of Area 3A not including the Bering Sea (Area 3B South), according to the recommendation of the International Pacific Halibut Commission to the Governments of the United States and Canada for the 1965 fishing season. The regulations this year contained several important changes from 1964.



Fresh halibut being unloaded with a cargo net from the hold of a halibut fishing vessel at Seattle, Wash.

International (Contd.):

March 25, was the opening date for fishing in Area 3B Northeast and Area 3B Northwest. In 1964, the area designated as Area 3B North (now divided into 2 areas--3B Northeast and 3B Northwest) was opened to fishing on the same date. This year fishing in Area 3B North Triangle began on April 4, 10 days later than the opening date of March 25 last year. Area 3B South was opened to fishing on April 12 this year, 6 days later than last year's opening date on April 6. The opening date of May 1 for Areas 1, 2, and 3A is the same as last year.

The opening and closing of the various regulatory areas shall be 6 p.m. Pacific Standard Time of the date indicated, except in Areas 3B North Triangle, 3B Northeast, and 3B Northwest where the opening shall be 3 p.m. and the closing 6 p.m. local time.

Fishing areas shall be: Area 1--south of Willapa Bay, Washington; Area 2--between Willapa Bay and Cape Spencer, Alaska; Area 3A--between Cape Spencer and Shumagin Islands; Area 3B South--waters west of Area 3A, not including Bering Sea; Area 3B North Triangle--waters between a line from Unimak Pass to the Pribilof Islands north of the Aleutian Islands and east of 170° W. longitude; Area 3B Northeast--waters in Bering Sea east of 175° W. longitude and outside of Area 3B North Triangle; Area 3B Northwest--all the remaining waters in Bering Sea.

In Area 1 the fishing season, without catch limit, shall end at the same time as that in Area 2. (Last year Area 1 was open to September 15, the date on which Area 2 closed.)

In Area 2 the fishing season shall end at the time of attainment of the catch limit of 23 million pounds or on September 15, whichever is earlier. This is 2 million pounds less than last year's quota of 25 million pounds, and is 5 million pounds less than the 28-million-pound quota in 1963. The catch limit in Area 2 in 1964 was not attained by September 15 when the season closed. As of September 2, the Area 2 catch was only 17.6 million pounds. The final catch was about 5 million pounds less than the quota.

In Area 3A the fishing season shall end at the time of attainment of a catch limit of 34 million pounds or on October 15, whichever is earlier. The catch limit is the same as

last year. In 1964 Area 3A closed on August 19.

In Area 3B South the fishing season shall end at the time of attainment of a catch limit of 4 million pounds or on October 15, whichever is earlier (the closing date last year was October 15 and the catch limit was the same).

In Area 3B Northeast the fishing season, without catch limit, shall end on June 20, and in Area 3B Northwest the fishing season, also without catch limit, shall end on November 15. Last year fishing in the area designated as 3B North ended on October 15.

In Area 3B North Triangle the fishing season shall end on April 11 after a fishing period of 7 days. Last year Area 3B North Triangle had a catch limit of 6,393,340 pounds or closure on October 15, whichever was earlier. That catch limit was to be shared among Canada, the United States, and Japan. Fishing in Area 3B North Triangle was very poor in 1964 with only 1.6 million pounds taken by United States and Canadian fishermen as of September 2. In 1964 fishing ended October 15 and only about one-third of the quota had been caught.

The Commission in 1965 will provide 10 days' notice of closure in Areas 1 and 2, 18 days' notice of closure in Area 3A, and at least 18 days' notice of closure in Area 3B South.

The Commission's recommendations for the 1965 season were announced on January 21 at the conclusion of its 41st annual meeting at Vancouver, B.C., Canada, with Chairman Harold E. Crowther of Washington, D.C., presiding.

The Halibut Commission is responsible to Canada and the United States for the investigation and regulation of the halibut fishery of the northern Pacific Ocean and Bering Sea. Its function is the development of the halibut stocks to levels that will permit the maximum sustained yield. Its decisions regarding regulation are based on scientific findings of its staff.

A public session was held on January 19 at which time the research conducted by the scientific staff and this past year's fishery were reviewed. On January 21, a meeting was held with the Conference Board, which consists of representatives of fishermen's unions,

International (Contd.):

vessel owners, and with representatives of dealer organizations, at which time the Commission received various industry proposals for regulation of the fishery in 1965.

During executive sessions the Commission dealt with administrative matters and approved a research program for 1965 which will include several fish tagging operations in Hecate Strait, and in the Gulf of Alaska and Bering Sea. In addition to those field activities, monitoring of the effects of foreign fishing on the stocks of Pacific halibut will also be greatly increased.

The Commission announced that the 1966 annual meeting will take place at Seattle, Wash. The date was not specified. Dr. William M. Sprules of Ottawa, Ontario, was elected chairman and Harold E. Crowther, vice-chairman, for the ensuing year.

Since in the past the United States and Canadian Governments have accepted the recommendations of the Commission without changes, it is fairly certain that the 1965 regulations as recommended by the Commission will be approved by the two Governments.

Note: See Commercial Fisheries Review, May 1964 p. 43.

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

REGULATIONS FOR 1965 SOCKEYE AND PINK SALMON FISHERY IN NORTH PACIFIC:

The tentative suggestions for regulatory control of the 1965 sockeye and pink salmon fishery in North Pacific Convention waters, as submitted to the fishing industry on December 11, 1964, were reconsidered on the basis of suggestions made by the Advisory Committee at a meeting of the International Pacific Salmon Fisheries Commission on January 29, 1965.

Action taken by the Commission in view of the Committee's recommendations is as follows:

1. The closure to all net fishing in both Canadian and United States Convention waters lying westerly of the Angeles Point-William Head line originally recommended to be "June 23 (6:00 a.m.) to July 31" was changed to read "June 27 to July 31."

2. An official policy was adopted on the weekly starting time for gill nets and purse seines in those

Canadian Convention waters lying westerly of the William Head-Angeles Point line: namely, that gill nets would start first each week for the fishing season of 1965 as originally recommended on December 11, 1964. Purse seines would start first in 1966 with the weekly starting time for each gear alternating each year thereafter.

3. Commencing September 5 the fishing time for gill nets in Canadian Convention waters lying westerly of the William Head-Angeles Point line was changed to read 7:00 p.m. to 7:00 a.m. and purse seines to 7:00 a.m. to 7:00 p.m.

4. To achieve conformity in the precedence of fishing time for purse seines, reef nets, and gill nets in United States Convention waters, the scheduled period for purse seines and reef nets starting first each week was changed from "June 27 to July 31" to "June 27 to August 7." Commencing August 8 and extending to the end of Commission controls gill nets would start first for each weekly fishing period.

5. The date for relinquishing control in any section of Convention waters will be reconsidered at appropriate times throughout the fishing season.

CANADIAN CONVENTION WATERS:

West of William Head-Angeles Point Line and East of Bonilla-Tatoosh Line:

- | | |
|-----------------------------|--|
| June 27 to July 31 | - Closed to all net fishing. |
| August 1 to August 14 | - Gill nets open daily 6:00 p.m. to 6:00 a.m.
Sunday afternoon to Tuesday morning of each week |
| | - Purse seines open daily 6:00 a.m. to 6:00 p.m.
Monday and Tuesday of each week |
| August 15 to September 4 | - Gill nets open daily 6:00 p.m. to 6:00 a.m.
Sunday afternoon to Wednesday morning of each week. |
| | - Purse seines open daily 6:00 a.m. to 6:00 p.m.
Monday, Tuesday, and Wednesday of each week. |
| September 5 to September 18 | - Gill nets open daily 7:00 p.m. to 7:00 a.m.
Sunday afternoon to Wednesday morning of each week. |
| | - Purse seines open daily 7:00 a.m. to 7:00 p.m.
Monday, Tuesday, and Wednesday of each week. |
| August 13 to September 19 | - Closed to commercial hook-and-line fishing on Saturday and Sunday of each week. |
| | - Relinquish control. |

East of William Head-Angeles Point Line Including Areas 17, 18, That Portion of Area 19 Lying Easterly of the Referenced Line and District No. I:

- June 27 to August 28 - Open 8:00 a.m. Monday to 8:00 a.m. Wednesday of each week.

International (Contd.):

August 29 to
October 9

Open 8:00 a.m. Monday to
8:00 a.m. Tuesday of each
week except for the week
commencing September 12
when all net fishing will be
prohibited.

October 10

- Relinquish control.

Special Troll Restrictions:

Fishing for sockeye or pink salmon other than by angling or trolling for the purpose of personal consumption and not for sale or barter shall be prohibited in these Convention waters of Canada (the waters of Howe Sound excepted), lying easterly and inside of a straight line projected from Gower Point at the westerly entrance to Howe Sound to Thrasher Rock light, thence in a straight line to Salamanca Point on the southerly end of Galiano Island, thence in a straight line to east Point on Saturna Island, thence in a straight line towards Point Roberts light to the intersection with the International Boundary line, thence following the International Boundary line to its intersection with the mainland from the 22nd day of August to the 9th day of October, both dates inclusive, except at the times that net fishing other than with spring salmon nets may be permitted within that area.

UNITED STATES CONVENTION WATERS:

West of Angeles Point-William Head Line and East of Bonilla-Tatoosh Line:

June 27 to July 31

- Closed to all net fishing.

August 1 to
August 7

- Gill nets open daily 7:00 p.m.
to 9:00 a.m.
Monday afternoon to Wednes-
day morning of each week.

- Purse seines open daily 5:00
a.m. to 9:00 p.m.
Monday and Tuesday of each
week

August 8 to
August 28

- Gill nets open daily 7:00 p.m.
to 9:00 a.m.
Sunday afternoon to Tuesday
morning of each week

- Purse seines open daily 5:00
a.m. to 9:00 p.m.
Monday and Tuesday of each
week.

August 29 to
September 18

- Gill nets open daily 7:00 p.m.
to 9:00 a.m.
Sunday afternoon to Wednes-
day morning of each week.

- Purse seines open daily 5:00
a.m. to 9:00 p.m.
Monday, Tuesday, and Wed-
nesday of each week.

August 13 to
September 13

- Closed to commercial troll-
ing on Saturday and Sunday
of each week.

September 19

- Relinquish control.

East of Angeles Point-William Head Line:June 27 to
August 7

- Gill nets open daily 7:00 p.m.
to 9:00 a.m.

August 8 to
August 28

Monday afternoon to Wednes-
day morning of each week.

- Purse seines and reef nets
open daily 5:00 a.m. to 9:00
p.m. Monday and Tuesday
of each week.

- Gill nets open daily 7:00 p.m.
to 9:00 a.m.
Sunday afternoon to Tuesday
morning of each week.

- Purse seines and reef nets
open daily 5:00 a.m. to 9:00
p.m. Monday and Tuesday
of each week.

August 29 to
October 2

- Gill nets open daily 7:00 p.m.
to 9:00 a.m.
Sunday afternoon to Wednes-
day morning of each week.

- Purse seines and reef nets
open daily 5:00 a.m. to 9:00
p.m. Monday, Tuesday, and
Wednesday of each week

September 5 to
September 18

- Waters westerly of a straight
line projected true south
from Lily Point to the inter-
section with the Internation-
al Boundary line will be
closed to all net fishing.

September 19 to
October 2

- Waters westerly of a straight
line projected from Iwer-
sen's dock on Point Roberts
towards Georgina light at
Active Pass to the intersec-
tion with the International
Boundary line will be closed
to all net fishing.

October 3

- Relinquish control.

Notes: (1) Times are based on Pacific Daylight Saving Time.
(2) See Commercial Fisheries Review, March 1965 p. 60; April 1964
p. 45.

KING CRAB

U. S.-SOVIET AGREEMENT ON KING CRAB FISHING ON U. S. CONTINENTAL SHELF OF NORTH PACIFIC:

An agreement on fishing for king crab on the U. S. Continental Shelf in the North Pacific was signed by the United States and the Soviet Union on February 5, 1965, at Washington, D.C. Signing of the agreement concluded several weeks of consultations between the two countries.

The two countries agreed that in accordance with the provisions of the United Nations Convention on the Continental Shelf, the king crab is a resource of the Continental Shelf over which the coastal nation has sovereign rights for the purposes of exploration and exploitation. The consultations took into account that the Soviet Union has maintained a king crab fishery for several years on the United

International (Contd.):

States Continental Shelf in the eastern Bering Sea and in other areas of the Northeastern Pacific, and that United States fishermen have at present only a small fishery for king crab in the eastern Bering Sea. Because of those factors, the United States agreed that Soviet fishermen may continue to fish in the eastern Bering Sea for two years at a reduced level of catch. Soviet fishermen will not fish for king crab in other areas of the United States Continental Shelf.

The agreement also provides for conservation measures to be applied to the crab fishermen of both countries in the eastern Bering Sea for continued and intensified scientific study of the king crab resource there, and for enforcement of the terms of the agreement. The agreement specifies a substantial sub-area in which only crab pots, the type of gear used by United States fishermen, will be used for commercial crab fishing. The two Governments will hold further consultations prior to the end of the two-year period.

The desirability of consultation with other countries prior to implementation of the U.S. Continental Shelf provisions of Public Law 88-308 (so-called Bartlett Act) was pointed out by President Johnson in his statement May 20, 1964, when he signed the law. Consultations were held between the United States and Japan in fall 1964 regarding the Japanese crab fishery in the eastern Bering Sea, and an interim two-year agreement was signed November 25, 1964.

Note: See Commercial Fisheries Review, February 1965 p. 51.

FISH MEAL

WORLD PRODUCTION, NOVEMBER 1964:

World fish meal production in November 1964 was up about 43 percent from the same month in 1963 due mainly to a sharp increase in Peruvian output. (Editor's Note: The Peruvian Government is reported to be con-

World Fish Meal Production by Countries, January-November 1963-1964				
Country	Nov.		Jan.-Nov.	
	1964	1963	1964	1963
..... (Metric Tons).				
Canada	5,971	8,338	50,594	72,921
Denmark	8,881	5,559	104,526	92,729
France	1,100	1,100	12,100	12,100
German Fed. Rep.	5,239	4,775	68,784	68,567
Netherlands	1/	700	2/6,700	6,300
Spain	I/	2,875	1/	21,687
Sweden	I,005	783	5,978	5,957
United Kingdom	5,286	4,894	69,093	68,651
United States	8,093	12,079	3/183,768	207,458
Angola	5,241	2,990	52,716	24,384
Iceland	3,177	750	118,486	79,017
Norway	13,099	12,076	175,729	121,983
Peru	181,673	116,167	1,371,235	1,019,604
So. Afr. (incl. S.-W. Afr.)	9,700	4,269	260,628	237,341
Belgium	375	375	4,125	4,125
Chile	9,641	3,698	134,620	79,575
Morocco	350	1/	3/18,450	1/
Total	258,831	181,428	2,638,532	2,122,399

1/ Data not available

2/ Data available only for Jan.-Oct. 1964.

3/ Revised.

Source: International Association of Fish Meal Manufacturers.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

sidering the introduction of catch limits to conserve fish resources.)

World fish meal production in the first 11 months of 1964 was considerably above that in the same period of 1963. The increase was due largely to expanded production in Peru which accounted for about 52 percent of world output during January-November 1964. Higher production during January-November 1964 was also reported in Norway, South Africa, Chile, Iceland, Angola, and Denmark. The increase was partly offset by lower production in Canada and the United States.

MARINE OIL

WORLD PRODUCTION,
1960-1964 AND FORECAST 1965:

World production of marine oils in 1964 was up slightly from 1963, but below output in 1961 and 1962. A steady decline in baleen whale oil production since 1961 has not been

World Marine Oil Production^{1/}, Average 1955-59, Annual 1960-1964, Forecast 1965

Item	Forecast 1965	2/ 1964	1963	1962	1961	1960	Average 1955-59
..... (1,000 Short Tons)							
Baleen whale oil	230	250	295	390	428	418	427
Sperm whale oil	155	170	149	130	120	122	119
Fish and fish-liver oil	735	710	655	750	669	511	428
Total	1,120	1,130	1,099	1,270	1,217	1,051	974

^{1/} Data are estimates based on official statistics of foreign governments, other foreign source materials, reports of U. S. Agricultural Attaches and Foreign Service Officers, and other sources.

^{2/} Preliminary.

International (Contd.):

offset by the modest increase in sperm oil production. Fish oil output has held fairly steady since 1961 with production averaging close to 700,000 short tons annually.

Total production of marine oils in 1965 is expected to be about the same as in 1964. World productive capacity for fish oil increased slightly in 1964. This could result in somewhat higher output of fish oil in 1965 if catch results and yields are favorable. Any increase in fish oil, however, will probably be offset by lower production of whale oil in the Antarctic. (U. S. Department of Agriculture, World Agricultural Production and Trade, January 1965.)

Note: See Commercial Fisheries Review, October 1964 p. 46.

EUROPEAN ECONOMIC COMMUNITY

FISH LANDING RIGHTS IN MEMBER COUNTRIES:

A new regulation of the European Economic Community (EEC) allows its fishermen to land fish in any member country by obtaining a certificate known as D. D. 5. The "D. D. 5" regulation came into force November 1, 1964.

French fishermen claim the new regulation is a threat to their minimum price structure, and the French Government has requested the postponement of the regulation.

In reply to the French opposition, spokesman for EEC Headquarters in Brussels said, "The right to land fish in member countries has existed ever since the Treaty of Rome came into effect, but the new regulation insures that minimum prices maintained in the various countries will be recognized." (The Irish Skipper, December 1964.)

Note: See Commercial Fisheries Review, December 1964 p. 93.

LATIN AMERICAN FREE TRADE ASSOCIATION

FOURTH ANNUAL CONFERENCE:

The Fourth Annual Conference of the Latin American Free Trade Association (LAFTA) was held late in 1964 at Bogota, Colombia. The Conference resulted in various tariff cuts by individual countries and also produced the group's first common schedule. The common schedule (products which will be completely free of duties in intra-LAFTA trade by 1973) was signed by all members of LAFTA, except Uruguay. An escape clause mechanism was created for agricultural imports within

LAFTA after 1973. The common schedule includes 113 products which account for slightly more than 25 percent of present intra-LAFTA trade.

The Conference also approved a resolution on goals other than tariff reduction. The resolution sets forth some ambitious programs for LAFTA including a study for the establishment of a credit system for LAFTA trade, and a LAFTA policy on the location of new industry.

Some of the proposals presented at the Conference, such as automatic linear tariff reductions and LAFTA payments system, were not seriously considered by the negotiators but simply passed on to the permanent organization for study.

A meeting of the Foreign Ministers of the LAFTA countries, accompanied by other ministers in charge of LAFTA affairs, is scheduled to take place some time between April 1 and August 31, 1965. The Fifth Annual LAFTA Conference will be held in Montevideo, Uruguay, from October 19 to December 4, 1965. (International Commerce, January 25, 1965.)

FOOD AND AGRICULTURE ORGANIZATION

SYMPOSIUM ON INCREASING FISH CONSUMPTION HELD AT 11TH SESSION OF INDO-PACIFIC FISHERIES COUNCIL:

A symposium on "Increasing Fish Consumption by Improved Handling and Distribution" was held during the 11th Session of the Indo-Pacific Fisheries Council (IPFC) at Kuala Lumpur, Malaysia, October 16-31, 1964.

Some 37 papers on 9 main topics were given at the symposium which among others included: (1) technology and economics of fish production; (2) handling and icing fresh fish aboard vessels and at shore; (3) use of preservatives to extend keeping time of fresh fish; (4) marketing, cooperatives, etc.; (5) inspection and quality control; and (6) consumer education.

Conclusions arrived at from the symposium were that working papers and discussions held provided ample material on the present status of research done in the fields considered, as well as on practical developments in the region covered. But what is urgently required, it was felt, is the application of the knowledge that is available, and taking into consideration the

International (Contd.):

specific influence of local conditions, social structure, consumer demand, etc.

It was proposed that a Working Party on Fresh Fish Preservation be established and that member Governments compile information on fresh fish handling and distribution for consideration by the Working Party. (IPFC Current Affairs Bulletin No. 41, December 1964.)

Note: See Commercial Fisheries Review, March 1965 p. 64.

INTERNATIONAL INDIAN OCEAN EXPEDITION

FISHERY OBSERVATIONS DURING RESEARCH VESSEL "ANTON BRUUN" CRUISE OFF EAST AFRICA:

During September-November 1964, the oceanographic research vessel Anton Bruun operated off the east coast of Africa as part of the International Indian Ocean Expedition. Observations of a U. S. Bureau of Commercial Fisheries scientist who participated in that cruise follow:

In Durban harbor (South Africa) in late September 1964, there were 3 long-line vessels (2 of Taiwan and 1 of Japanese registry) all landing frozen tuna for storage and transshipment for a Japanese company. The 2 vessels from Taiwan were older than the one from Japan but all had facilities for blast-freezing their catches and for separate frozen fish storage. All had conveyor-belt arrangements for transfer of gear from the working area forward to the storage area near the stern.

No great amount of fishing is done out of Durban. In September some whales were being landed. They were towed from catcher boats to a marine railway near the mouth of the harbor where they were unloaded and moved (on flat cars) to a plant where they are



Shows a finback whale being transported by flat car to a Durban processing plant.

efficiently disassembled. One new product being produced from the whales is something like a beef bouillon cube.

From the time the Anton Bruun left Durban on September 25 until arrival at Mombasa on November 9, no commercial fishing vessels larger than a rowing skiff were seen other than one of the long-line vessels previously seen in Durban Harbor.

Fishing trials during this cruise did not produce much to indicate the presence of exploitable fishery resources. But there were indications of the presence of good concentrations of penaeid shrimp and "European" lobsters (Neophrops) in depths of 200-250 fathoms off Delagoa Bay (Lourenco Marques) Mozambique. A catch of very large shrimp (Peneus) was made off Formosa Bay, Kenya, in shallower water.

Note: See Commercial Fisheries Review, September 1964 p. 16.

UNITED NATIONS

SPECIAL FUND ASSISTS FISHERY RESEARCH IN LOW-INCOME COUNTRIES:

Assisting research into the seas' resources and to the development of fishing industries is only a small part of the wide range of activities of the United Nations Special Fund. Such assistance is designed to accelerate economic progress throughout the world.

World food production has increased only slowly in recent years and has not been able to keep pace with the rapid increase in the world's population. If further and increasingly widespread malnutrition and hunger in the low-income countries is to be prevented, new sources of food must be developed. To feed their growing populations, nations are turning more and more to the sea. Because the sea is a potential economic resource of great magnitude, the United Nations Special Fund has been helping Governments exploit the resources and wealth within their seas. This is done under that organization's program of assistance by providing surveys of natural resources, applied research, and training. The total cost of the program is now more than \$1 billion, which represents a partnership investment with funds provided through the voluntary contributions of 112 Governments and by the recipient countries themselves.

The Special Fund is presently assisting 16 ocean and inland fisheries projects at a total cost of \$39 million. Eight of those projects are already under way; 8 more projects have been authorized by the Governing Council of the Special Fund and work on them is about to commence. All of those projects are being executed for the Special Fund by the Food and Agriculture Organization (FAO) of the United Nations.

FISHERY EXPANSION IN LATIN AMERICA: The fishery industries of Latin America's Pacific Coast have rapidly expanded in recent years. Chile, Peru, and Ecuador are all countries that have in the past depended heavily on exports of a single major product. In spite of long coastlines, those countries have had no tradition as seafaring nations. In the last five years,

International (Contd.):

however, all this has changed and the economy of the three countries has been transformed by a great "rush to the sea."

PERU: To a great extent, the lead in this development was given by Peru's fishing industry, and in each case the process of transforming traditional patterns and methods into modern techniques is being accomplished by similar means. At the beginning of major economic development of the fishing industry it was realized that it would be necessary to set up a special controlling institute to supervise the development of those fisheries and to gather information by research that could then be analyzed and published as routine statistics.

The situation in Peru is unique in the unusually heavy dependence of the fishing industry on anchoveta, the raw material for fish meal production which represents 98 percent of Peru's fishery catch. With an export value in 1962 of \$100 million, anchoveta are Peru's largest foreign currency earner. That fishery is such that even a slight change in the abundance or the distribution of fish could violently shake the structure of the whole industry. This could be brought about by factors so slight as an infinitesimal change in the temperature of the water, or a small movement of the dominant offshore currents. The unique feature of the \$1.7 million Peruvian Sea Institute, which was established in 1960 and is being assisted over a four-year period by the Special Fund, is that it was built not to develop an industry, but to study the biological basis of an already established industry and extend the potential of its development.

The Institute's research is being carried out with two vessels, the *Unanue* and the *Explorador*. The biological and oceanographic information that has been collected is then analyzed by six laboratories. The work undertaken by the Institute recently took on an added importance in view of a marked decline in anchoveta catches. Information that was obtained while investigating this catch decrease showed that seasonal changes in the trade-wind pattern affected the upwelling of nutrient-rich waters and as a result, the concentration of marine organisms. The need for systematic information on seasonal variations in the Peruvian Sea-region was emphasized. The continuing reports of the Institute are proving of great value in interpreting sea conditions and fishing prospects.

CHILE: With its extremely long coastline stretching 2,600 miles from the tropics to the Antarctic, Chile has access to abundant fish resources, capable of supporting a large fishery industry. Although the development and utilization of those resources is important for the nourishment of a population of 8 million, expansion and new investment have hitherto been hampered due to: (1) a lack of detailed biological and economic knowledge, (2) lack of modern vessels and fishing gear, and (3) inadequate methods of catching, processing, and marketing.

The \$4.5 million Fisheries Development Institute, which began operations in November 1963, is providing the Government of Chile with the technical basis for accelerated development within the current ten-year development plan. Studies are being made of the nature, distribution, and density of marine resources, the improvement of fishing methods and the economics of exploitation. The Special Fund is assisting the Institute over the first four years of operation. During those

years, emphasis is given to studies of the anchovy fishery in Northern Chile because of its importance to the fish meal industry and of the "merluza" in Southern Chile in view of the possibility of substantial exports of that fish species.

Two laboratories have been established in Northern Chile. One is being used for quality control based on chemical analysis of fish meal and oil. The other laboratory, located in one of the fish meal factories, is investigating methods of utilizing stickwater. Another laboratory is scheduled to be built at the Institute's headquarters in Santiago.

ECUADOR: The first real direct exploration of the waters off Ecuador's coast is being promoted by the \$1.3 million National Fishery Institute which was established in 1960, and is being assisted over a four-year period by the Special Fund. That Institute has conducted extensive studies on the distribution and density of marine resources and the best means of exploiting those resources. Among a wide range of activities the Institute is sponsoring has been the improvement of the quality of shrimp exports by individual rather than bulk freezing, and the use of dried and salted fish.

REGIONAL PROGRESS: Apart from their national work the three Institutes are also taking part in a joint oceanographic program which also includes Colombia, Panama, and the Inter-American Tropical Tuna Commission. This consists of a study of the periodic warming of coastal waters known as the "El Niño Phenomenon," which is thought to have a considerable effect on the distribution of fish in the Pacific.

NIGERIA: Like the Pacific, the Eastern Atlantic Ocean has wide areas of underexploited fishing grounds. In Nigeria, for example, half of the estimated 100,000 metric tons of fish that is consumed annually is imported. The present inadequacy of marketing arrangements has resulted in a shortage of fish in the interior markets of that country. There is an urgent need to improve production through modern fishing methods and through raising the quality of the fish catch.

The Special Fund is assisting the Governments of the western and mid-western regions of Nigeria with a four-year survey of their available fishery resources. The cost of the survey is \$829,000 and is being carried out in two phases. The first phase will be devoted to the collection of basic information to determine the most economic way of catching fish and then distribution of the catch from a central collecting point. The second phase will involve demonstration and pilot schemes in both inland and ocean fishing.

The general fisheries survey was completed in June 1964. Studies were made of the existing methods and equipment used in both the inland waters and the trawl fishery in Lagos. The present methods of fish handling, storing, marketing, and distribution were also appraised. A report is to be prepared on that survey. At the same time in Lagos and Avietore, demonstrations and training were given by experts in the construction and operation of various types of fish nets and of fish smoke-drying.

ZAMBIA AND RHODESIA: In the Central African area the Governments of Zambia and Rhodesia are giving their support over four years to the \$1 million Lake Kariba Fisheries Research Institute. With the aim of fostering the sound development of a fishing industry and ancillary activities in the Lake Kariba area, the

International (Contd.):

Institute has since October 1963 been conducting a physio-chemical and biological survey of the Lake. Studies have been made both of methods of fishing and of the types of fish and their size. When those studies are completed, the surveys will provide valuable data for the development of a major inland fishing area.

INDIA: The present diet of the great majority of the population of India is too heavily dependent on the single staple product of grain. The development of a modern fishing industry would go a good part of the way towards remedying such a deficiency. With this end in view, the Government of India established in 1958 a committee to review the training of fisheries officers. The Special Fund is assisting that Government for three years with the establishment of a \$1.3 million Fisheries Training Institute in Bombay, to train District Fishing Officers for both the Central and State Governments, and managers for the fishing industry. Through the work of the Institute, leaders are being provided who are trained in the techniques of developing and exploiting inland and marine fisheries.

Good results have already been achieved by the Institute. The Mysore State Government has been so impressed by what has been achieved in the first training courses that it has ruled that recruits for supervisory posts in its fisheries department must have a diploma from the Fisheries Institute. It is believed that other States will shortly make similar rulings.

KOREA: The fishing industry of Korea was built up after 1952 with extensive United Nations assistance. But for the most part, the industry still is a small operation and present fishing grounds are all near the coast. If Korea is to take a place among the modern large-scale fishing countries, "offshore" fishing will have to be developed. Surveys indicate that this will be possible over the next ten years.

The Korean fishing industry will directly benefit from a \$2.26 million Deep-Sea Fishing Center in Pusan which has just been established by the Government and which is being supported by the Special Fund during the first five years. This Center will become the basis of the country's fishery training system and will offer technical training both ashore and at sea, to graduates of colleges and other vocational schools as well as the fishermen. It is hoped that the trainee output of the Center will be between 50 and 75 graduates a year, a number that should be immediately absorbed by the industry.

OTHER SPECIAL FUND FISHERY PROJECTS: In a number of other areas, Special Fund fishery projects have been approved and will shortly be carried out. In the Caribbean a major investigation of fishing techniques and marketing is being assisted by the Special Fund for four years at a cost of \$2.2 million. That study will, it is hoped, lead to the expansion of fisheries through the exploitation of fish species that are presently untouched. Deep-sea fishing in the Philippines, which in spite of considerable offshore resources is at present heavily dependent upon imports of fish, will be promoted through studies and training that will be carried out on several experimental fishing vessels with Special Fund assistance over five years at a cost of \$3 million.

Another six fishery development projects in the new program of 66 requests for Special Fund assistance have recently been approved by the 13th Session of the Governing Council of the Special Fund. In Taiwan, the Special Fund is giving assistance over a four-year period to the establishment of a \$7.5 million Institute at Taipei, which will work for the modernization of the shipping industry and will train cadet officers for the merchant marine service.

A \$2.2 million fishery research unit in Ghana will be supported during its first five years and will carry out the studies required for forming the basis of a rapid increase in fishery production from available resources. A survey of the fisheries in East Pakistan will also be made over a five-year period at a cost of \$1.6 million which will assess the potential for increased production, and develop a core of competent and skilled fishermen.

The development of the fishing industry in Argentina will be assisted over five years at a cost of \$3 million through exploratory and experimental fishing conducted with associated biological and hydrographic studies. The Special Fund will also assist Governments with with two regional projects: (1) one costing \$4 million designed to assist for six years the strengthening of fishery administrations in Central America and to improve processing and marketing methods; (2) the other aimed at the development and management of fresh-water fisheries in Kenya, Uganda, and the United Republic of Tanzania over a five-year period at a total cost of \$1.3 million. (United Nations, New York.)



Australia

TUNA SURVEY OFF TASMANIA
PLANNED FOR 1965:

Hopes are high that the planned joint tuna searching program off Tasmania in 1965 will further stimulate that Australian State's fishing industry. The survey will be undertaken between January and June by two chartered tuna vessels supported by a spotting aircraft.

A joint statement by the Commonwealth Minister for Primary Industry and the Tasmanian Minister for Agriculture said that the cost of the survey would be shared equally by the Commonwealth (from the Fisheries Development Trust Account) and the State.

With the reopening of canning factories in Tasmania, the processing of tuna (should the fishery become established in waters adjacent to Tasmania), barracouta, and Australian salmon should no longer present problems.

Other major developments in the Tasmanian fishing industry during 1964 included: (1)

Australia (Contd.):

The extension of scallop dredging to new areas off the east coast, leading to an extension of the season; (2) the construction of 8 new vessels for the State's spiny lobster fishery (those replace vessels which have transferred to Victoria, and others sold to fishermen in other Australian States); and (3) the development of facilities for fishermen at fishing ports. (Australian Fisheries Newsletter, January 1965.)

Note: See Commercial Fisheries Review, November 1964 p. 75.

* * * * *

TUNA FISHERY TRENDS, 1936-64:

Australia's tuna landings increased spectacularly in the 1963/64 season, with a record catch of 9,000 short tons, more than double the tuna catch in the previous season. The tuna catch is now the greatest in quantity of any finfish landed in Australia.

Most of the tuna is canned in factories at or close to the two main tuna ports--Port Lincoln in South Australia and Eden in New South Wales. The canned product is practically all sold on the local market, with only small exports mainly to the Pacific Islands. Production of canned tuna in 1963/64 was about 4.7 million pounds, an increase of 135 percent over the 1959/60 output of 2 million pounds. Consumption of canned tuna in Australia has risen from about 3.2 ounces per capita in 1959/60 to about 7.5 ounces in 1963/64.

Frozen tuna (round) has been exported from Australia for several years, mainly to the United States. In 1963/64, Australia's total exports of frozen round tuna amounted to 3.3 million pounds, worth A£204,000 (US\$457,000).

The presence of tuna in Australian waters in possible commercial quantities was established in 1936 when aerial surveys of pelagic fish were pioneered. But until 1949 Australian fishermen neglected tuna, mainly because sporadic catches could not justify a canning industry and because trolling (which was then the only known way of catching tuna) was relatively slow. Canneries were in operation at Narooma and Eden, but both of them concentrated on Australian "salmon" (*Arripis trutta*). The canneries merged in 1949 and New South Wales fishermen, who were then experiencing a lean time, were offered 6 pence a pound live-weight for tuna landed. Tuna production

in 1949, using trolling gear, was about 1,000 tons of bluefin.



Fig. 1 - Australian tuna vessel.

In 1950/51, the Australian Commonwealth Government chartered the 63-foot United States-Fijian tuna clipper *Senibua*, which spent four months in Australian waters assessing the value of the pole-and-live-bait fishing method. Results were encouraging, and the industry began to gear itself to take advantage of the annual tuna runs off the southern New South Wales coast.

The first Australian vessel built especially for tuna pole fishing was the *Fair Venture* which was launched in late 1951. After a disappointing first season in New South Wales, the vessel went to South Australia. The first tuna poled by a commercial vessel in South Australia were taken by the *Fair Venture* in 1952. Facilities to handle the catch were then inadequate, and further development of the South Australian fishery was delayed until 1956. In that year, two Californian tuna fishermen were invited by the South Australian Government to undertake exploratory pole-fishing for tuna. Other South Australian vessels followed suit, and after a few seasons of preparation and consolidation, the fishery began to assume its present proportions.

Australia (Contd.):



Fig. 2 - Pole-and-line fishing for bluefin tuna off southern Australian coast.

The Australian tuna fleet in 1963/64 consisted of 37 vessels in New South Wales, ranging between 21 and 105 feet in length, and 14 vessels in South Australia, from 48 to 85 feet long.

The mainstay of the tuna fishery since its inception in Australia has been the southern bluefin (*Thunnus thynnus maccoyii*). The schools are exploited during their surface-swimming phase, when their weight ranges between 20-80 pounds. As they grow larger, they move into deeper water layers, at which time they become the target, along with other species, for Japanese long-liners in the eastern Indian Ocean and the southwest Pacific. Southern bluefin tuna is thus the basis of an international fishery exploited in two distinct stages.

Yellowfin tuna (*Neothunnus macropterus*) are known to frequent Australian waters, and

have been taken in southern New South Wales waters. The spatial distribution of yellowfin in that area makes them more accessible to long-line fishing. Since 1963, a small but developing fishery for large adult yellowfin has been operated by Australian fishermen, using a modified long line.

Striped tuna or skipjack (*Katsuwonus pelamis*) occur on a definite seasonal pattern between Coff's Harbour (New South Wales) and St. Helen's (Tasmania). In 1963, experimental fishing with monofilament nylon gill nets was undertaken for skipjack off Lakes Entrance, Victoria, with some success. Marketing difficulties at present inhibit the further development of that fishery, which produces fish of from 8 to 16 pounds, which canneries regard as smaller than can be economically handled at the standard prices paid for tuna.

Australian tuna vessels range in size from 21-foot trolling vessels to 105-foot clippers. Most of the tuna is caught by the live-bait-pole fishing method with small quantities taken



Fig. 3 - U. S. tuna fishing expert unloading bluefin tuna from the Port Lincoln vessel *Tacoma*.

Australia (Contd.):

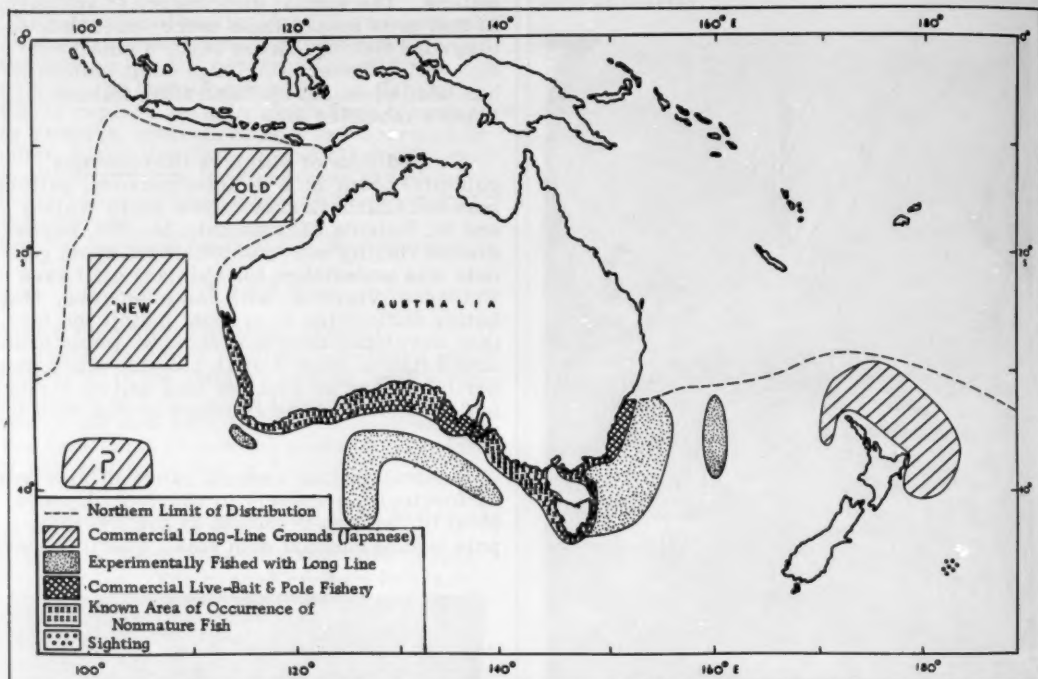


Fig. 4 - Southern bluefin tuna (*Thunnus thynnus maccoyii*) distribution and fishing grounds in waters off Australia and New Zealand.

by trolling, and some striped tuna being caught with monofilament nylon gill nets.

Although many small vessels have live-bait tanks, the major portion of the catch is taken by vessels of from 60 to 100 feet long, some of which have been designed specifically for tuna fishing, others being conversions from various types of vessels. The larger vessels use refrigerated sea water to hold their catch for periods of up to 5 or 6 days, and smaller vessels, which generally make shorter trips, and often return to port daily on the east coast, use ice as required. (Australian Fisheries Newsletter, January 1965.)

Note: See *Commercial Fisheries Review*, November 1964 p. 75; September 1964 p. 56.

FISHERIES TRENDS, FISCAL YEAR 1963/64:

Highlights: During fiscal year 1963/64, Australian fishermen developed new scallop

grounds off Victoria and landed record tuna catches in New South Wales and South Australia to boost total Australian landings of fish and shellfish to a record level. The value of Australian exports of fishery products also rose to a record level in 1963/64 as new markets were developed for scallops and abalone. But Australian imports of fishery products continued to exceed fishery exports in 1963/64, because domestic landings could not satisfy the growing demand in Australia. There is a particularly strong demand in Australia for imported frozen fillets in consumer packs.

Landings: Australian fishery landings in fiscal 1963/64 (July 1963-June 1964) were up 10 percent in quantity and 5 percent in value from the previous fiscal year. Main reasons for the increase were larger catches of tuna and scallops.

The Australian tuna catch rose from 11 million pounds in 1962/63 to 17.9 million

Australia (Contd.):

Table 1 - Australia's Fishery Landings by States, 1962/63 and 1963/64¹

Species	New South Wales		Victoria		Queensland		South Australia		Western Australia		Tasmania	
	1963/64	1962/63	1963/64	1962/63	1963/64	1962/63	1963/64	1962/63	1963/64	1962/63	1963/64	1962/63
	(1,000 Pounds)											
Finfish	32,819	31,598	13,448	12,611	8,919	9,041	20,357	16,137	8,807	8,017	2,774	2,879
Spiny lobster .	400	498	823	1,531	10	31	4,325	4,650	18,500	21,380	3,572	3,310
Shrimp	6,107	6,623	-	3	5,118	4,971	-	-	2,118	1,017	-	-
Crab	103	228	-	-	571	571	-	-	26	36	-	-
Oyster	12,462	12,604	50	63	170	330	404	-	6	28	2	1
Scallop	-	-	10,967	-	846	627	-	-	18	-	4,260	5,871
Other shellfish	64	22	536	867	114	119	1,699	-	221	8	-	-
Total	51,955	51,573	25,824	15,075	15,748	15,690	26,785	20,787	29,696	30,486	10,608	12,061

Note: See table 2 for footnotes.

Table 2 - Australia's Fishery Landings with Ex-Vessel Value, 1962/63 and 1963/64¹

Species	1963/64			1962/63		
	Quantity	Value		Quantity	Value	
	1,000 Lbs.	AL	US\$	1,000 Lbs.	AL	US\$
Finfish	87,373	6,580	14,608	80,589	6,146	13,644
Spiny lobster .	27,630	5,715	12,687	31,393	6,018	13,360
Shrimp	13,344	2,182	4,844	12,616	1,914	4,249
Crab	704	73	162	843	83	184
Oyster	13,094	1,232	2,735	13,030	1,122	2,491
Scallop	16,091	357	793	6,498	244	542
Other shellfish	2,634	174	386	1,016	39	87
Total	160,870	16,313	36,215	145,985	15,566	34,557

¹Preliminary.

Notes: (1) Landed weights are shown. Total landings in table 2 are greater than the combined total landings in the individual states which do not include landings in the Northwest Territory.
(2) AL 1.00 equals US\$2.22.

pounds in 1963/64. There are also indications that the Australian catch of salmon (*Arripis trutta*) was up about 2 million pounds in 1963/64.

Scallops were landed in significant quantities in Victoria for the first time in 1963/64. During that period, the new Port Phillip Bay beds yielded 10,967,000 pounds of scallops with an ex-vessel value of A£200,000 (US\$444,000). That greatly outweighed a drop in scallop landings in Tasmania.

Australian shrimp landings in 1963/64 reached a record 13.3 million pounds due to heavier landings in western Australia.

A gain was also recorded for abalone as new markets were developed for that item. Spiny lobster landings, however, were down 12 percent from the previous year.

Exports: Australian exports of fishery products in 1963/64 were valued at A£8.3 million (\$18.4 million), an increase of about

12 percent from the previous year. The main reasons for the increase were improved prices for Australian spiny lobster tails in the United States, expansion of the scallop market in France, and an increase in frozen tuna exports to the United States.

Spiny lobster products make up the bulk of Australian fishery exports. Other export items are shrimp, scallops, abalone, and tuna. Pearls, pearl shell, whale products, and a small quantity of canned fish are also included in Australia's marine exports.

The main markets are the United States (for spiny lobster, tuna, and shrimp), France (for scallops and spiny lobster), and Japan (for shrimp, pearls, and pearl shell).

Table 3 - Australian Imports of Fishery Products, 1962/63 and 1963/64

Item	1963/64			1962/63		
	Quantity	Value		Quantity	Value	
	1,000 Lbs.	AL	US\$	1,000 Lbs.	AL	US\$
Frozen Products:						
Fish	37,989	4,583	10,174	32,579	3,564	7,912
Shrimp	1,656	489	1,086	723	213	473
Other shellfish	532	120	266	328	46	102
Canned Products:						
Fish	24,200	4,394	9,755	20,911	3,815	8,469
Shellfish . . .	887	290	644	619	224	497
Smoked and Dried Products						
Fish	8,522	956	2,122	8,945	835	1,854
Other products	2,164	265	588	1,899	235	522
Total	75,950	11,097	24,635	66,004	8,932	19,829

Note: AL 1.00 equals US\$2.22.

Imports: Australian imports of fishery products in 1963/64 were up 15 percent in quantity and 24 percent in value from the previous year. Canned and frozen fish continue to be the main fishery import items. The bulk of the frozen fish imports are South African hake fillets, and British bream and

Australia (Contd.):

cod fillets packed in 1-pound and 5-pound cartons.

Domestic Consumption: Australian consumption of fishery products increased from 112 million pounds valued at A£9.7 million (\$21.5 million) in 1962/63 to 122 million pounds valued at A£11.0 million (\$24.4 million) in 1963/64. Imported frozen fillets accounted for a large part of the increase in domestic consumption. The demand for fish fillets is met by imports since the Australian fishing industry produces only small quantities of fish for filleting. It appears that a domestic fillet-processing industry could be developed with trawl fish from New South Wales and Victoria. (Australian Fisheries Newsletter, January 1965.)

Note: See *Commercial Fisheries Review*, Jan. 1965 p. 63, and Oct. 1964 p. 51.

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DEVELOPMENT OF SPINY LOBSTER INDUSTRY SPURRED BY FOREIGN DEMAND:

Australia's export of spiny lobster (tails and whole boiled) has for more than 10 years been the leading edible fishery export item. The Australian home market for that product is small and the spiny lobster industry, which has been established and developed as a result of constant overseas demand, is largely dependent on foreign markets.

The Australian spiny lobster industry has enjoyed a period of rising prices practically since it started--interrupted only for short periods, the most recent being in 1962/63. But in 1963/64 record wholesale prices of up to \$2.30 a pound were paid in the United States for Australian frozen spiny lobster tails.

Less dependence on the United States market has been a recent feature of Australia's overseas market for spiny lobster. France, which was a minor buyer five years ago, now imports nearly 2 million pounds of Australian spiny lobster tails and whole boiled spiny lobster a year. Canada, Belgium, Luxembourg, Italy, and Japan are also increasing their imports of Australian spiny lobster.

Despite this widening demand on world markets, the United States still remains, by far, Australia's best customer, taking about 80 percent of the total exports. Market con-

ditions in the United States have an important influence on the spiny lobster industry in Australia. The United States market is influenced by the level of inventories and the availability of supplies from local and other overseas sources. Both those factors suggest the high prices will continue. Inventories in the United States of spiny lobster tails were low early in 1965, and in September 1964 they were the lowest for 1964.



Fig. 1 - Two larger specimens of Australian spiny lobster.

While the market outlook for the Australian spiny lobster industry is generally satisfactory, the supply position is possibly less attractive. Leading fishing authorities have suggested that production from known Australian sources is probably approaching the optimum and that supplies for export have reached their peak. In Western Australia, in particular, the trend suggests there has been some reduction in the average size of spiny lobster produced. Midget sizes are becoming an increasing portion of the total harvested while medium and jumbo sizes are declining.

In other Australian States, although no details of grades are available, preliminary figures show that production in 1964 will be down from the previous year. The concern at production levels is reflected in a variety of management measures in force throughout Australia. Unexploited stocks still exist, particularly in the north, where the "painted" spiny lobster is known to exist.

Australia appears to have an assured market for all the spiny lobster it can produce.

Australia (Contd.):

High overseas demand should keep prices high but the main immediate problem could be maintaining supplies. The Australian spiny lobster industry has been developed on a tide of rising prices and increased catches. If the management measures to be undertaken are for any reason either too little or too late, some production decline may occur.

Australian spiny lobster fishermen use a number of methods for holding them aboard their vessels. Small vessels (18 to 35 feet), working inshore and returning to port or tying up each night, generally hold them in bags and unload them daily. Many of the small vessels used in Western Australia are built of marine plywood and have a "V" bottom. Those shallow-draft "scoota boats" are most popular and suitable for working around inshore reefs and in the shallow waters of the Abrolhos Islands area. Larger vessels, from 30 to 85 feet long, make trips of from 2 or 3 days up to 5 or 6 weeks and hold their catch in wet wells, open to the sea water, or in tanks with sea water pumped through them.

A number of processing vessels from 52 to over 100 feet long operate in Western Aus-



Fig. 2 - Australian spiny lobster boat taking on beehive-type pot.

tralia. The catch is processed aboard and the tails are quick frozen in boxes of 25 pounds ready for export.

The beehive type pot is the most commonly used gear. A rectangular or "D" shaped trap is used on the New South Wales coast and a rectangular pot constructed of wooden battens is popular in the Geraldton and Abrolhos Islands area of Western Australia. Although the size and shape of the beehive pot does not vary greatly, materials used in its construction range from cane to cane and ti-tree, to steel frames covered with wire or synthetic netting.

Mechanical hauling winches, driven from the main engine or an auxiliary, are found on most vessels. The pot line is hauled over a roller on the rail, through a snatch block attached to a davit, or through a roller on a pot tipper which is hinged on the rail of the boat. The tipper is in a vertical position during hauling and when the pot comes up to it and trips a release, it tips inboard into a horizontal position with the pot sitting on top of it.

Synthetic pot lines have been introduced to the industry and may eventually replace natural fibers. (Australian Fisheries Newsletter, January 1965.)

Note: See Commercial Fisheries Review, January 1965 p. 61.

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SHRIMP FISHERY CONTINUES TO EXPAND:

Australia's modern shrimp fishery is a very recent development. Prior to 1947, Australian fishermen took shrimp only in estuaries and inshore waters. Then offshore shrimp grounds were discovered and explored off both the east and west coast of Australia. As a result, Australian shrimp landings nearly doubled between 1959 and 1964.

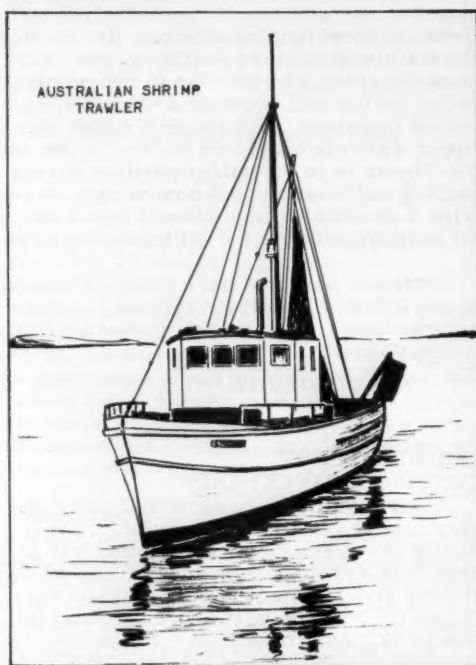
Efforts are now being made to develop new Australian shrimp fishing grounds. In 1964, a shrimp fishery was begun at Exmouth Gulf in Western Australia. In early 1965, an exploratory shrimp fishing survey was under way on the north coast in the Gulf of Carpentaria. The north coast survey is a joint project of the Commonwealth and the Queensland Governments.

Discovery of new shrimp grounds in the Gulf of Carpentaria, and in other areas off

Australia (Contd.):

northern Australia, could help relieve the pressure on existing grounds, but care in managing any new fisheries would be required to avoid excessive concentration of fishing effort.

Australian shrimp trawlers range in size from small launches used in the estuaries and bays to vessels of about 85 feet in length that work in offshore waters in depths of up to 150 fathoms. Most of the offshore shrimp vessels are powered by diesel engines and many are equipped with echo-sounders and radio transmitters.



On offshore shrimp vessels, the trawl is set and hauled from the stern of the vessel, the cod end being lifted over the side by the boom tackle and emptied on a sorting table or into a pound on the deck.

An overhead method of hauling the trawl warps is generally used in which the warps are led from the winch to blocks positioned above the winch drums and then to the gallows blocks, leaving headroom beneath the warps where they pass over the deck. (Australian Fisheries Newsletter, January 1965.)

SCALLOP EXPORTS CONTINUE TO GROW:

Most of the scallops produced in Australia were absorbed by the domestic markets until fairly recently. But with the opening up of new beds in Victoria a growing export trade for them has been started.

Official Australian statistics do not record exports of scallops separately, but it is estimated that the quantities of scallop "meat" exported amounted to 23,400 pounds in 1961/62, 91,000 pounds in 1962/63, and 761,000 pounds in 1963/64. Exports to France during 1963/64 were 657,000 pounds or 86 percent of the total exports of scallop meats.

For the past 10 years up to 1962/63, Tasmania provided over 80 percent of Australia's scallop production, the remainder being produced by Queensland. The "in-shell" weight of scallops produced in Tasmania ranged from 3.8 million pounds in 1953/54 to 5.9 million pounds in 1962/63.

Recent growth in the newly established scallop fishery in Victoria, on beds in Port Phillip Bay, has greatly increased overall production. Preliminary data for 1963/64 show that Australian scallop production amounted to 15.4 million pounds (in-shell weight) valued at A£354,000 (US\$793,000), of which Victoria produced 10.9 million pounds, Tasmania 4.3 million pounds, and Queensland 170,000 pounds.

In Victoria, the commercial scallop (*Pecten alba* Tate) has yielded outstanding catches. Whereas the other scallop fisheries in Australia show definite seasonal trends, the Port Phillip fishery has been productive all year. Scallops have also been taken from the Shark Bay area of Western Australia, but full commercial exploitation of those grounds has not yet begun.

In Tasmania--the traditional scallop-producing State--commercial (*Pecten meridionalis*), dough boy (*Mimachlamys asperrim*), and queen (*Equichlamys bifrons*) scallops are taken from D'Entrecasteaux Channel, and on the east coast of the island.

When shrimp trawling began in offshore waters near Yeppoon, Gladstone, and Bundaberg (Queensland), commercial catches of saucer scallops (*Amusium ballotti*) were made simultaneously. But the scallop fishery has not yet attained commercial importance because the shrimp fishery is more profitable.

Australia (Contd.):

It is, however, an important addition to Queensland's fisheries.

Scallops are taken by two methods in Australia--by otter trawl and dredges. In Queensland, shrimp trawlers are used with modified shrimp trawl net, and in Victoria and Tasmania a wide variety of vessels from 25 to over 50 feet long use the standard scallop dredge or the Baird type, which is commonly called the "sputnik" dredge. (Australian Fisheries Newsletter, January 1965.)

Note: See Commercial Fisheries Review, November 1964 p. 77; October 1964 p. 51; September 1964 p. 58.

ABALONE FISHERY PROMISING:

Another fishery in Australia showing increasing commercial importance is for abalone. Export data for 1962/63 show that about 13,700 pounds of abalone (meat weight) was sold to Hong Kong. During the 1963/64 season an estimated 180,000 pounds valued at A£50,000 (\$112,000) was exported to Japan, and another 2,300 pounds was shipped to Hong Kong. A small market for abalone was also opened up in New Caledonia.

Market prospects are reported to be very favorable in Malaysia where there is considerable demand for the canned product. Potential markets also have been found in the United States where demand is best for canned abalone.

The abalone fishery has an interrupted history in Australia. Abalone (Haliotis spp.) is a marine gastropod or snail which inhabits rocky foreshores and reefs. The edible portion is regarded by many people, especially in Asia, as a delicacy. Little is known of the size of the abalone stocks, and some concern has been felt that Australian abalone might be depleted to the same extent as in California.

Abalone is taken in the Australian States of New South Wales, Victoria, and Tasmania, where a minimum size of 5 inches is in force. Abalone harvesting is done by shore-based divers and from small vessels of all types, SCUBA gear is generally used, and "hooka" gear has been tried from small boats. (Australian Fisheries Newsletter, January 1965.)

Note: See Commercial Fisheries Review, December 1964 p. 82

QUEENSLAND FISHERY TRENDS, 1963/1964 SEASON:

Productive shrimp (king) fishing grounds were discovered by the shrimp trawling fleet out of Queensland, Australia, in 1964 as it extended its operations in deeper water than formerly fished.

The discovery of new unexploited shrimp grounds has stimulated the construction of larger vessels designed to remain at sea despite changes in weather, and to operate in waters as deep as 150 fathoms. In 1964, the construction of larger vessels increased by about 25 percent, and in 1965 at least 12 more large vessels are being built. One of them is 70 feet long.

Research is producing useful results in the shrimp and mullet fisheries largely as a result of close and continuing cooperation between the fisheries staffs of the Queensland and Commonwealth Governments. Such cooperation is also extended by the Commonwealth Scientific Industrial Research Organization (CSIRO).

The shrimp research unit, which has been working in the Gulf of Carpentaria since August 1963, is now planning an extension of its work to include studies of the East Coast shrimp stocks. Knowledge which has already been gained in the Gulf is expected to be of considerable value in furthering those studies.

Studies which were started several years ago into the mullet stocks of the Noosa Lakes have been stimulated by the assistance given by CSIRO and also by the advice given by an officer of the Food and Agriculture Organization's (FAO) Fisheries Division during his visit to Queensland in October 1964. The study, which is to be published, will be used in compiling a wider thesis on the mullet stocks of the Eastern Australian seaboard.

Tuna, which is known to be abundant offshore, where it is caught by long-lining, cannot at present be caught profitably by Australian vessels using that gear. Experiments in the south with a modified long line are being watched with interest and a survey is being planned to determine when and where tuna occur closer to the coast in shoals which feed at the surface and which can be caught by other and more profitable fishing methods than the long-line method.

A further development which will be of great value to the Queensland fishing fleet is

Australia (Contd.):

the provision of a harbor at Mooloolaba where moorings, a fish dock, and other facilities have been approved. Construction of those facilities is scheduled for this year. (Australian Fisheries Newsletter, January 1965.)

Note: See Commercial Fisheries Review, November 1964 p. 76.

FISHERY TRENDS IN

SOUTH AUSTRALIA, 1953-64:

Fisheries production in the State of South Australia has more than doubled in the past 10 years. In 1953/54 it was 12.1 million pounds and in 1963/64 it climbed to 25.5 million pounds.

The establishment of a tuna industry has accounted for the substantial increase and, during the last 10 years tuna production has grown from only 6 short tons (1953/54) to 6,043 tons (1963/64).

While the tuna fishing industry has been developing in a spectacular fashion, that State's Director of Fisheries and Game said that aggregate production in other commercial fisheries is static notwithstanding fluctuations which may occur from year to year in production of certain species. The chance of developing new fisheries in inshore waters is not particularly encouraging, he said.

With the exception of tuna, little is known of the fisheries potential in offshore waters. Exploratory fishing in the Great Australian Bight would suggest that demersal fisheries are there, but who has the capital to risk another venture in those waters, he added. Therefore, in the immediate future, it would appear that development opportunities in offshore waters are dependent on tuna.

Provision of adequate port facilities for fishing fleets is said to be an acute problem. During recent years the South Australian Government has spent some A£500,000 (US\$1.1 million) on facilities for the special use of fishermen. Consideration is being given to lengthening docks in the southeast area, the building of a dock at Port Lincoln for the tuna fishing industry, shelter harbors at Ceduna and Port Adelaide, and a number of other projects.

Under the South Australian "Loans to Producers Act," funds continue to be available

both to fishermen and those at a secondary level in the industry. Those funds have assisted in the maintenance of the spiny lobster fishing industry and also have been a prime factor in the development of the South Australian tuna industry. (Australian Fisheries Newsletter, January 1965.)

VICTORIA FISHERY TRENDS IN
1963/64 SEASON:

The development of fisheries out of Victoria, Australia, for scallops, striped tuna, and abalone were among the more notable achievements in that State's fishing industry in 1963/64, reported the Director of Fisheries and Wildlife at Victoria. That State's Fisheries and Wildlife Department together with the Underwater Explorers Group paved the way to the development of the scallop fishery by an underwater survey of Port Phillip Bay beds. This stimulated the interest of a few Tasmanian fishermen, who crossed Bass Strait to start commercial scallop fishing in September 1963. The fishery developed rapidly, and 90 boats dredged for scallops in the Bay in 1964 to supply local and export markets.

During 1963/64, the striped tuna fishery was developed, using monofilament nylon gill nets. The fishery operates from Lakes Entrance during the summer and autumn, and three boats supply a Melbourne fish cannery. The Victorian State Government provided funds to finance fishermen equipping boats for the striped tuna fishery.

Promising local and export possibilities are reported for the abalone fishery, which is operated by divers along the coast.

Port facilities in Victoria were improved at a number of important fishing centers. New slipways were built at Lakes Entrance, Queenscliff, and Port Fairy, and vessel harbors were improved at Port Welshpool, Portarlington, and Geelong. Harbors at Port Welshpool, Geelong, Port Fairy, Apollo Bay, and Portland were deepened by dredging.

Marine research programs are in progress in the scallop, black bream and King George whiting fisheries, and data are being collected for the Australian salmon (*Arripis trutta*) and southern spiny lobster programs of the Commonwealth Scientific and Industrial Research Organization (CSIRO).

Australia (Contd.):

Mussels, squid, and abalone were designated as fish for the purpose of the Fisheries Act so that catch and processing returns can be collected as a preliminary to research work on those species.

In the future it is anticipated that a blue-fin tuna fishery using live bait pole-fishing may be developed in Victorian waters. Also that trawler operations may be introduced with the aid of echo-sounding equipment to spot fish shoals. (Australian Fisheries News-letter, January 1965.)

FISHERY TRENDS IN WESTERN AUSTRALIA, 1963/64 SEASON:

Spiny lobster fishing--the largest single fishing enterprise in Australia--and Western Australia's main fishery, continues to be a profitable and sound money earner.

In 1963 there were 2,526 fishermen engaged in spiny lobster fishing in Western Australia, and total production was 21 million pounds valued at A£4 million (US\$9 million).

At its peak in 1961/62, exports of spiny lobster and spiny lobster tails were valued at \$10.5 million, but due to a price drop in the United States market in 1962/63, exports dropped to \$8.9 million. In addition to tails, markets have been established for whole cooked spiny lobster. More shipments are now being made to France, Singapore, and Western Germany.

The Shark Bay shrimp fishery in Western Australia, which started in 1963, is said to be making satisfactory progress. Production in the first season was 1.2 million pounds of tiger and king shrimp, and this climbed to 2 million pounds in 1964. The fishery has extended to Exmouth Gulf, where "banana," as well as king and tiger shrimp are fished. Total production in the Gulf in 1963 was 39,000 pounds and in 1964 it was 36,000 pounds. There was a ready market for king and tiger shrimp, but banana shrimp were difficult to sell.

Humpback whaling has now stopped in Western Australia, in accordance with the decision of the International Whaling Commission. The two whaling companies there have now turned to sperm whaling. The Car-

narvon station will in the near future be transferred to Fremantle. The Albany company has obtained a third chaser vessel and substantially increased its take of sperm whales. There was a decided fall in the price of sperm oil on the world's markets in 1964.

Recent improvements at Western Australian fishing ports from public funds include: (1) A much enlarged fishing vessel harbor, with ancillary services, at Fremantle; (2) harbor and dock facilities for fishing vessels at Geraldton; (3) improved handling facilities at Shark Bay; (4) a jetty for use by fishermen at Port Denison (Dongara). In addition, privately-owned facilities have been installed at several places.

The Western Fisheries Research Committee has continued its work, and research on spiny lobster, shrimp, Australian salmon (*Arripis trutta*), and tuna is proceeding under the supervision of that committee. (Australian Fisheries Newsletter, January 1965.)

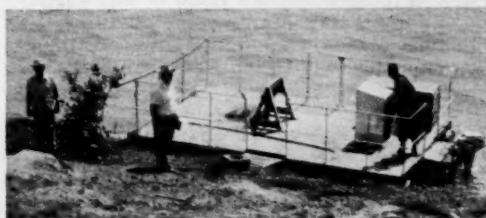


Brazil

U. S. AID FOR DEVELOPMENT OF FRESH-WATER FISHERIES:

The Alliance for Progress plans to help finance, with a contribution of \$60,000, the building of 16 reservoirs in Northeast Brazil for production of fresh-water fish. This is the result of the work done by the U. S. Bureau of Commercial Fisheries five-man mission to Brazil in 1964. The study was made in cooperation with the U. S. Agency for International Development (AID) and the Alliance for Progress.

In addition, AID has agreed to sponsor an investment survey on fishery resources in Brazil and Argentina. The survey is to be



Research raft used by Division of Hunting and Fishing, State of Sao Paulo, on Limerao Reservoir.

Brazil (Contd.):

done by a Tennessee fishery company which is interested in the production potential of a brackish water catfish reported to be plentiful in both Brazil and Argentina.

Note: See Commercial Fisheries Review, March 1965 p. 68.

**Burma****BIDS INVITED ON CANNED MACKEREL AND SAURY:**

The Burmese Government purchasing agency invited foreign firms to submit tenders on January 18, 1965, for 42,300 cases (can size not designated) of canned saury in tomato sauce (for February shipment) and 28,200 cases (1-lb. oval) of mackerel in tomato sauce (for March shipment). Japanese canned fishery products reported to be available for sale by the Japan Canned Sardine and Saury Sales Company include 36,000 cases (1-lb. tall) of canned saury in tomato sauce and approximately 110,000 cases of canned mackerel in tomato sauce, consisting of 50,000 cases of 1-lb. oval, 40,000 cases of 8-oz. oval, and about 16,000 cases of 5-oz. tall. (Suisan Tsushin, January 7, 1965.)

**Canada****OTTER TRAWLING IN CERTAIN "LOBSTER" WATERS OFF NEW BRUNSWICK BANNED:**

Otter-trawl fishing in the New Brunswick section of Passamaquoddy Bay at the southern end of the Bay of Fundy has been prohibited by the Canadian Fisheries Minister. The order was announced February 12, 1965, and became effective immediately. The restriction applies to "all waters north of a straight line drawn from Deadman Head to East Quoddy Head and all Canadian waters north of Campobello Island, including all waters of Passamaquoddy Bay in the Province of New Brunswick."

In that relatively small body of water, dragnets interfere excessively with other methods of fishing because of exceptional natural conditions. Lobster trap operators find it impossible to mark their gear adequately because the strong Passamaquoddy tides draw buoys under the surface and out

of sight except during the brief periods of slack water. Also, Passamaquoddy Bay is one of the few areas where lobsters inhabit grounds favorable for dragging. Lobsters usually prefer rough, rocky bottom which is unsuitable for trawl nets, but in Passamaquoddy Bay they exist on smooth bottom. As a result, trawl nets could have an adverse effect on lobster stocks. (Canadian Department of Fisheries, Ottawa, February 12, 1965.)

BRITISH COLUMBIA FISHERY LANDINGS, 1964:

The value of fishery landings by British Columbia fishermen was the third highest in 1964 as compared with other years, according to the Department of Fisheries of Canada. The total landed value for all species in 1964 was C\$48.3 million as against \$49 million in 1962 and \$52.3 million in 1958. The value of salmon landings in those years is in the same order. In 1964 it was \$30.2 million; 1962, \$30.6 million; and \$37.1 million in 1958.

For the second year in a row, silver or coho salmon topped all other species in value, establishing new value and production records. Over 28.5 million pounds of silver salmon were landed in 1964 with an ex-vessel value of \$9.25 million. About 65 percent of the silver salmon landings was troll-caught. The 1964 sockeye catch of 22.9 million pounds had a value of \$8.25 million. The catch and ex-vessel value were slightly above the five-year average of 1959-63. The chinook or spring salmon catch with a record high was in third place. Landings of 12.1 million pounds were valued at \$5.5 million. The 1964 pink salmon landings totaled 36.5 million pounds with a value of \$4 million. The chum or fall salmon catch of 23.9 million pounds with a value of \$3.1 million was the highest since 1958.

British Columbia's 1964 halibut landings totaled 33.9 million pounds, the fourth largest landings on record. It was the highest percentage proportion (56.7 percent) of the total United States-Canada halibut catch ever taken by Canadian fishermen. Of the total catch, 8.2 million pounds were landed at United States ports by British Columbia vessels. The halibut ex-vessel value was \$8.3 million--second only to the record 1962 value of \$10.9 million.

The herring fishery in British Columbia recorded its second highest year of landings

Canada (Contd.):

in 1964 when 252,500 tons with a value of \$6.2 million were landed at British Columbia processing plants. Also reaching a new high in value in 1964 were crab landings worth \$700,000. The value of shrimp landings dropped off sharply to \$161,000, the lowest since 1959.

Oyster production in 1964 was down from the record high of 1963 but totaled 153,000 gallons of meats worth \$587,000. About 1.6 million pounds of clams were harvested in 1964 with a total value of \$59,000, the lowest since the recording of detailed statistics on clam production in 1951. Abalone production during the year was about 125,000 pounds valued at \$20,000.

Groundfish landings were generally good in 1964. About 12 million pounds of grey cod valued at \$722,000 were landed, setting a new production record. The previous high catch was the 7.7 million pounds in 1958. Lingcod landings totaled 3.8 million pounds valued at \$384,000. That species provides a stable fishery showing less fluctuation than any other. Landings of different species of sole (6 varieties are listed commercially) amounted to 6 million pounds valued at \$409,000. Less than a million pounds of ocean perch valued at \$36,000 were landed during the year.

Nearly a quarter of a million pounds of tuna valued at \$40,000 were landed in British Columbia in 1964. About 4.8 million pounds of industrial fish for use as animal feed were landed in 1964. (Fisheries News, Department of Fisheries, Canada, January 28, 1965.)

FISHING VESSEL SUBSIDY EXTENDED:

In Canada, the 30 percent Government subsidy for the construction of fishing vessels 55 feet and over was extended to vessels in the 45- to 55-foot class. The maximum size of 99.9 gross tons remains the same. That change in the Fishing Vessel Assistance Regulations of the Federal Government was announced January 28, 1965. It is expected to speed the adoption of more versatile fishing craft, and give encouragement to fishermen in Canada's Atlantic Coast Provinces to acquire more efficient vessels.

In June 1964, the minimum size of Canadian vessels eligible for construction subsidies

from the Government was lowered to 35 feet, overall length, from the previous minimum of 45 feet. However, vessels under 45 feet are eligible for subsidy only when of an approved experimental design. Also, the subsidy which may be given to vessels of 35 to 44.9 feet is 25 percent of the cost approved by the Federal Minister of Fisheries, while the rate of 30 percent may now be paid for vessels from 45 feet in length overall up to the maximum of 99.9 gross tons. The subsidy is based upon the total approved cost of each vessel equipped and ready for fishing.

The Fishermen's Loan Boards in the Provinces of New Brunswick, Prince Edward Island, Nova Scotia, and Newfoundland, and the Minister of Industry and Commerce in the Province of Quebec are responsible for the direct administration of the subsidy regulations. Close control over the design and specifications of craft eligible for assistance is maintained by Federal-provincial cooperation. This will include consideration of the number of vessels to be built each year, and the coordination of vessel construction with training projects designed to provide skilled manpower for a modern Atlantic fleet. (Canadian Department of Fisheries, Ottawa, January 28, 1965.)

VESSEL INSURANCE PLAN EXTENDED:

As an incentive to fishermen to invest in more efficient fishing vessels, the Canadian Federal Fisheries Minister has raised the upper limit on vessels which may be insured under the Fishermen's Indemnity Plan to C\$15,000. Previously the limit covered only vessels costing up to \$12,500. There is no change in the lower limit of \$250.

The Fishermen's Indemnity Plan of the Canadian Government came into operation in 1953. It offers fishermen owning and operating fishing vessels the opportunity to secure insurance against total or partial loss for an annual premium of 1 percent of the appraised value of the vessel. Because of the wide dispersion of small fishing vessels in many hundreds of fishing settlements, commercial marine insurance companies have found it impracticable to offer insurance to fishermen at rates within fishermen's capacity to pay.

Under the Government Plan, insured fishermen are compensated for total loss of a vessel at the rate of 60 percent of the value

Canada (Contd.):

in the Atlantic Provinces and 70 percent in British Columbia. There are also provisions for compensating partial losses. (Canadian Department of Fisheries, Ottawa, January 28, 1965.)

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**OCTOBER 1965 PROCLAIMED AS
"NATIONAL FISH 'N SEAFOOD MONTH':"**

Special recognition is to be given to the Canadian fishing industry and the resource on which it is built with a proclamation by the Canadian Fisheries Minister declaring October 1965 as "National Fish 'n Seafood Month."

The Minister's proclamation points to the important role Canada's extensive ocean and fresh-water fish resources have played in the discovery and development of Canada from coast to coast. It also emphasizes the valuable contribution the fishing industry makes to the livelihood of thousands of Canadians, and to the nutritional well-being of populations at home as well as those in the widely dispersed foreign markets to which Canadian fishery products flow.

Some 80,000 Canadian fishermen engage part or full time in the fisheries. The total landed value is as high as C\$125 million, and the market value of fishery products is about \$250 million. Aside from those directly engaged in the industry, many more thousands benefit from the subsidiary employment which the fisheries provide in the packaging, transportation, and other allied industries.

Canadian fishermen catch about 150 different species of fish and shellfish which are processed and marketed in a wide variety of products. These go to countries all over the world, making Canada one of the world's three leading exporters of fishery products.

New impetus was given to modernization of the Canadian fishing industry as a result of the National Fisheries Development Conference held in Ottawa in 1964 and rapid expansion is now taking place in construction of new fishing vessels, introduction of new fishing techniques, and improvement of fish-handling facilities.



Chile

**FISHERIES TRENDS,
FOURTH QUARTER 1964:**

Chilean fish meal production in 1964 totaled 147,000 metric tons, an increase of 36 percent over the 108,000 tons produced in 1963. The increase in output would have been even greater if anchoveta had been more abundant in late 1964. (Editor's note: The movement of anchoveta beyond the limited range of the Chilean fishing fleet has been a recurrent problem for the Chilean fish meal industry.) In late November 1964, some of the purse seiners supplying the northern reduction factories began moving farther south into waters off Antofagasta Province in an effort to find anchoveta. Initially, Antofagasta fish canneries protested the "invasion" by the northern seiners, but the complaints seem to have subsided.



Fig. 1 - Crew of Chilean trawler (off of Valparaíso) lowering their net.

New reduction plants and facilities (recently completed, under construction, or planned) could give Chile a fish meal production capacity of over 400,000 tons in 1965. A larger anchoveta fishing fleet will be needed to supply the expanding industry. (In mid-1964, the Chilean anchoveta fleet numbered about 205 vessels, most of which were modern steel purse seiners of 100- to 170-ton hold capacity.)

The Iquique shipyard owned by a Chilean-United States firm has supplied many of the

Chile (Contd.):

vessels in the Chilean anchoveta fleet. In November 1964, the shipyard at Iquique laid the first keel of a new series of purse seiners (called the 82-I). The firm plans to produce four of the vessels each month and was expected to complete the first by March 1965.

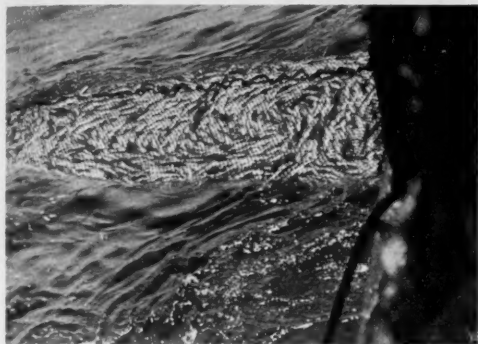


Fig. 2 - Cod end of trawl floating on the surface full of "merluza."

The Chilean fish reduction industry is centered in the northern Province of Tarapaca. Attention is now being given to developing fisheries in other Provinces of Chile. In late 1964, scientists from the Chilean Institute of Fisheries Development studied waters off southern Chile where there is little in the



Fig. 3 - Fishermen bringing their catch of tuna ashore from small tuna boats.

way of a fishing industry. The study off southern Chile was particularly concerned with shrimp and spiny lobster in waters near Talcahuano and Valdivia, and with hake and anchoveta near the latter port. Initial findings were said to be encouraging. The survey off southern Chile is related to the need to diversify the highly specialized fisheries of Chile.

Diversification may be aided by the plans of a Chilean firm to can 5,000 cases of "king" crab which is to be distributed by a United States firm. In addition, a Japanese group which was previously in Chile surveying crab resources has returned for further studies. Although neither the United States firm nor the Japanese interests has invested in the local industry, both continue to show an interest in the Chilean crab resource. (United States Embassy, Santiago, October 29, 1964, and January 22, 1965.)

THREE MORE JAPANESE WHALERS LICENSED TO FISH OFF CHILE:

By Decree 580 of October 29, 1964, the Chilean Ministry of Agriculture authorized 3 Japanese whaling vessels to take whales for a 3 year period within jurisdictional waters claimed by Chile. The Japanese vessels (Ryudo Maru, Ryudo Maru No. 5, and Seiho Maru No. 6) have a combined gross tonnage of 1,331 tons. The decree stipulated that the catch of the Japanese whalers must be landed at Chilean shore plants (sale at sea is prohibited).

Two other Japanese whalers had previously been granted 3-year licenses to operate within the 200-mile fishing limit claimed by Chile. The five Japanese whalers with Chilean licenses are all under contract to a Chilean processing firm based in Santiago, and all of the vessels have been furnished by one Japanese whaling company. (United States Embassy, Santiago, December 29, 1964.)

Note: See Commercial Fisheries Review, November 1964 p. 97; June 1964 p. 38.



Cuba

SOVIET AID TO FISHERIES:

The Chairman of the State Fisheries of the Soviet Union is reported to have made the following statement early in 1965 on Soviet aid to Cuban fisheries:

Cuba (Contd.):

In the summer of 1962, the first five Soviet medium-size trawlers arrived in Cuba. Cubans sailed on them with Soviet fishermen to learn the trade. The catch went to Cuba, and the Cuban Government purchased the trawlers to form the core of its new fishing fleet.

vicinity of Cuba and the Bahamas and also off the west coast of Florida and the Campeche Banks of Mexico. The Continental Shelf as well as deep areas are being studied. The expedition is scheduled to continue from May 1964 to May 1965. The Soviet research vessel Academician A. Kovalievski and several Cuban vessels are reported to be participating in the study. Object of the study is said to be a bet-



Now, says the Soviet fisheries Chairman, Cuba has a growing fishing fleet and 40 fishing cooperatives. Some 120 Cubans so far have been trained on Soviet vessels. Another 200 Cubans have been trained at the Soviet port of Kaliningrad and are working on the construction of Cuba's new fishing harbor at Havana. (*Fishing News*, London, January 29, 1965.)

OCEANOGRAPHIC STUDY IN GULF OF MEXICO AND SOUTH ATLANTIC CONDUCTED BY CUBAN-SOVIET EXPEDITION:

A Cuban-Soviet expedition is reported to be carrying out oceanographic studies in the

ter understanding of fishery resources and navigation. Work includes hydrological, hydrobiological, and hydrochemical studies. The expedition is also designed to give Cubans an opportunity to work with Soviet scientists, and to help with development of Cuban oceanographic centers. (*International Marine Science*, Vol. 11, No. 4, November 1964.)



Denmark

FISHERIES TRENDS, 1964:

Denmark's fishery landings in local ports by Danish vessels in 1964 increased 2 percent from the previous year, according to prelim-

Denmark (Contd.):



Fig. 1 - Fishing vessels docked in the Danish fishing port of Esbjerg.

nary data of the Danish Fisheries Ministry. An increase in the 1964 herring landings more than balanced the smaller landings of industrial fish, cod, and cod-like species. Pond trout production in 1964 was at a record high, as were landings of plaice, herring, and Norway lobster.

Table 1 - Danish Fishery Landings, 1964

Species	1/1964	1963
Landings in Denmark by Danish Vessels:		
Flatfish 2/	74,063	71,339
Cod	65,737	69,030
Cod-like 3/	58,544	64,072
Herring	360,625	290,872
Brisling	10,868	9,449
Mackerel	6,551	7,245
Eels	3,331	3,928
Salmon	1,371	2,386
Pond trout	8,460	7,804
Other fish 4/	241,746	293,585
Norway lobster	2,292	1,752
Deep-water shrimp	3,280	4,735
Other shellfish	60	138
Mussels	16,388	13,575
Starfish	3,447	1,769
Total	5/856,763	6/841,679
Landings in Denmark by foreign vessels	200,930	143,329
Grand total	1,057,693	985,008
Danish landings in foreign ports	4,290	12,016

1/Record annual total (preliminary).

2/Plaice, flounder, dab, common sole, etc.

3/Haddock, coalfish, hake, ling, etc.

4/Mostly industrial fish such as sand eels, Norway pout, etc.

5/Does not include Danish landings in foreign ports.

6/Includes 12,016 tons (about 60 percent) industrial fish landed in foreign ports by Danish vessels.

Source: Ministry of Fisheries.

Preliminary export data for 1964 show that larger quantities of fish and shellfish were produced as fresh, frozen, smoked, canned, and semipreserved products than in 1963. More fish was processed into fillets, and there was an increase in fish meal and oil production, but salted fish production was below 1963.

Table 2 - Danish Production of Processed Fishery Products, 1964

Product	Metric Tons
Canned:	
Herring and sprats	2,868
Mackerel	2,148
Other fish	4,196
Shellfish	994
Mussels	633
Total	10,839
Semipreserved:	
Herring and sprats	4,800
Other fish	382
Mussels	628
Total	5,810
Fresh and frozen fillets:	
Cod	20,873
Cod-like 1/	1,415
Plaice	18,556
Other flatfish	1,236
Herring	35,997
Other fish	163
Total	78,240
Smoked:	
Herring and sprats	2,001
Mackerel	1,808
Eels	705
Salmon and trout	514
Other	196
Total	5,224
Miscellaneous:	
Force meat 2/	1,708
Salted herring	127
Dry-salted cod	417
Other	1,279
Total	3,531
Industrial products:	
Fish meal	108,030
Fish oil	31,801
Fish solubles	11,829
Ensilage 3/	7,240
Total	158,900

1/Haddock, coalfish, hake, ling, etc.

2/Groundfish, milk and flour.

3/Chemically treated raw fish.

Source: Preliminary data from Ministry of Fisheries.

Based on 1963 data, the Fisheries Ministry estimates that about 85 to 90 percent of Denmark's fish meal and oil production is from whole raw fish and about 10 to 15 percent is from fish waste. On that basis, about 45,000 to 50,000 metric tons of fish were used for trout food, of which 90 percent was raw fish and 10 percent fish waste. About 120,000 to

Denmark (Contd.):



Fig. 2 - Danish fisherman standing on a typical live box or float in which live plaice are held for marketing in Fredrikhavn.

140,000 tons were used as food on fur-animal farms and for ensilage; about 75 percent (90,000 to 105,000 tons) was used on fur-animal farms. Of that amount, 60 to 75 percent (54,000 to 79,000 tons) was fish waste; 25 percent used for ensilage totaled some 30,000 to 35,000 tons. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 3, 1965.)

AGAR-AGAR INDUSTRY, 1963:

Danish production of agar-agar in 1963 totaled 834 metric tons valued at 9.4 million kroner (US\$1.36 million), according to preliminary data. Total Danish exports of agar-agar in 1963 were 826 metric tons valued at 10.4 million kroner (\$1.5 million). The principal markets were West Germany with 291 tons, France 170 tons, the United States 31 tons, and Argentina 40 tons. (United States Embassy, Copenhagen, February 10, 1965.)



German Democratic Republic

REVIEW OF FISHING INDUSTRY AND PRODUCTION TARGETS:

The most important task facing East Germany's fishing industry is to become completely self-sufficient in its fishery production. That was the theme of an article in the East German publication *Neues Deutschland*, November 29, 1964, as published in a Norwegian fishery trade paper. The article reviews East Germany's fishing industry and plans for projected development to 1970. Included was detailed information on the investment and construction projects necessary to reach a total fishery production of about 400,000 metric tons in 1970, or about double the 1964 production. The production target set for 1964 was 182,500 tons. In December 1964 the same periodical reported that the 1964 production would be greater than the goal set and that it would for the first time exceed 200,000 tons of herring and other species. The same report stated that the production target for 1965 is 240,000 tons.

Reaching the planned goal in 1970 is based on developments so far. In 1950 the East German fishery catch totaled 26,600 tons and in 1963 it was 177,200 tons. In that same period canned fish production increased from 1,100 tons to 17,700 tons. While production goals in the original seven-year plan (1958-65) have been substantially met, consumption has not increased as planned. The consumption goal was 18 kilos (39.7 pounds) but was later reduced to 16.5 kilos (36.4 pounds) per capita in 1965. But the statistics show that consumption in 1963 was 13.7 kilos (30.2 pounds) as compared with 12.2 kilos (26.9 pounds) in 1955. This is an increase in total consumption from 219,000 tons in 1955 to not more than about 235,000 tons in 1963. The result may be seen in statistics for the East German imports of herring and fish which show total imports of 141,000 tons in 1955 and a decrease of almost 50 percent to 71,000 tons in 1963. Statistics for canned fish imports show a decrease of about 40 percent from 10,500 tons in 1955 to about 6,300 tons in 1963. In comparison, East Germany's total exports in that same period increased almost 100 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, January 27, 1965.)



Ghana

FISHING INDUSTRY FAVORED BY CERTAIN TAX EXEMPTIONS:

The Government of Ghana allows "pioneer company" status to fish canners, ice manufacturers, and fish meal manufacturers. This status originally consisted of exemption from tax on profits for five years, but now the tax exemption may continue until the initial capital has been fully recovered.

Exemption from customs duties also is allowed on fish hooks, fish nets, and netting, and on the importation of all kinds of fish, except fish that is preserved only by chilling or freezing. Imported fish in that category carries a 10 percent ad valorem duty.

FISHERY RESEARCH CENTERED ON BIOLOGY OF SARDINE:

A long-range marine biological investigation has begun in Ghana in mid-1962 under the technical assistance of the Food and Agriculture Organization (FAO). This research program has two main objectives: (1) a study of the biology of the sardine (*Sardinella aurita*) with special regard to bionomics and composition of stocks, and (2) a study of the composition of demersal fish stocks and the effects of fishing operations on those stocks.

Sardines account for about 60 percent of the total annual fishery catch of Ghana, and demonstrates the importance of that species in the fisheries of the nation. Studies were started on the biology and movements of the sardine, using the research vessel *Kokote* of the Fisheries Station at Tema. Studies are also being made on the decline of the fishery for the "apapa" (*Caranx hippos*), a jack species, important in the Ghanaian fisheries.



Iceland

EX-VESSEL FISH PRICES SET FOR 1965:

A 5.5 percent increase in ex-vessel prices for groundfish caught on line and hooks in 1965 was announced January 12, 1965, by Iceland's Fish Pricing Board. Prices are based on dockside delivery to the purchaser.

Following are selected 1965 Icelandic ex-vessel prices for hook and line landings of first grade groundfish, gutted and heads-on:

Species	Price	
	IKr. /Kilo	U.S.¢/Lb.
Halibut:		
2-20 kilos (4.4-44 lbs.)	9.50	10.03
Over 20 kilos (44 lbs.)	12.86	13.58
Cod:		
Large--over 57 cm. (22 in.)	4.09	4.32
Haddock:		
Large--over 50 cm. (20 in.)	4.38	4.63
Ling:		
Large--over 72 cm. (28 in.)	3.23	3.41

For each species, ex-vessel prices range lower for smaller fish and fish of less than first grade. The price of third-grade cod and haddock for reduction is Kr. 0.84 a kilo (0.9 U. S. cents a pound). The price of ocean perch for reduction is Kr. 0.95 a kilo (1.0 U.S. cents a pound), while the price of ocean perch suitable for freezing is Kr. 3.34 a kilo (3.53 U.S. cents a pound).

The 1965 prices were set by the Government representative on a special 5-man arbitration committee. Both the arbitration committee and the full Fish Pricing Board were deadlocked when the Government representative intervened.

As part of the settlement of the price issue, the Government agreed to ask the Icelandic Parliament to provide a subsidy of Kr. 0.25 a kilo (0.26 U. S. cents a pound) for groundfish landings. (United States Embassy, Reykjavik, February 3, 1965.)

Note: Icelandic Kronur 43.0 equal US\$1.00.



Italy

SICILY EXPANDS

ATLANTIC FISHING FLEET:

In November 1964, the new fishing vessel *Giovanni Primo* sailed from Palermo, Sicily, on her maiden fishing venture in Northwest African waters near the Canary Islands. The 149-ton refrigerated vessel was built in Italy at a cost of about 150 million lire (US\$242,000), and is equipped with modern navigational and sounding instruments. The *Giovanni Primo* joins the growing number of Sicilian fishing vessels which since late 1962 have been fishing in the Atlantic off the northwest African coast.

Developments in the last 2 years emphasize the tendency for Sicilian fishermen to switch from the Mediterranean Sea to the more fruitful Atlantic Ocean. In May 1963, a businessman from Northern Italy established two firms

Italy (Contd.):

in Palermo to engage in Atlantic tuna fishing. Both firms were authorized in 1964 to increase their working capital to 100 million lire (\$160,000). One firm plans the construction of four 900-ton fishing vessels, and the other firm plans four 1,500-ton fishing vessels. The new vessels are to be built in Italy and registered in Palermo by the end of 1966.



One of the new tuna firms is believed to have the participation of a Japanese fishing company which is said to have invested 30 million yen (\$83,330), or more than half of the firm's capital. The Japanese firm will probably conduct the Sicilian firm's tuna fishing operations for at least the first couple of years.

Other fishing firms with plans for Atlantic fishing were established in Sicily during the last 2 years with the expectation of aid from the Sicilian Government. However, the Regional Government appears to be doing little to help the Sicilian fishing industry, and several of the new firms now appear to

have financial problems. (United States Consul, Palermo, December 16, 1964.)

Note: See *Commercial Fisheries Review*, December 1964 p. 96; October 1964 p. 59.



Japan

ATLANTIC TUNA FISHING TRENDS AND EXPORT PRICES, FEBRUARY 1965:

Japanese tuna catches in the Atlantic Ocean in early February 1965 consisted largely of albacore and yellowfin tuna, with albacore running 20 to 30 percent more than yellowfin in the catches. But because of the lower albacore tuna price on the United States market, Japanese tuna vessels fishing for that species are said to be gradually shifting to yellowfin.

Prices for Atlantic-caught albacore (frozen round) exported to the United States as of February 1965 were quoted at US\$275-280 a short ton f.o.b. West African port, the same as at the close of 1964. Sales were reported slow due to lack of buying interest among United States tuna packers.

Prices for Atlantic yellowfin (frozen dressed) exported to Italy were reported steady at about US\$425 a metric ton c.i.f. Indications of more claims because of dark meat in the yellowfin tuna shipped to that country were reported. (*Suisan Keizai Shim-bun*, February 16; *Suisan Tsushin*, February 9, 1965.)

EXPORT VALIDATIONS OF FROZEN TUNA AND TUNA LOINS TO U. S., JANUARY-DECEMBER 1963-64:

Japan's export validations of frozen tuna and frozen tuna loins to the United States in December 1964 totaled 5,113 short tons. Of that total, 59.6 percent were albacore tuna, 18.6 percent yellowfin, 1.0 percent big-eyed, 8.8 percent skipjack, and 12.0 percent tuna loins.

During January-December 1964, Japan's export approvals amounted to 109,593 short tons, an increase of 28,749 tons or 35.7 percent as compared with 80,744 tons exported during the same period in 1963. On a species basis, albacore exports in 1964 were up 61.9 percent, yellowfin 13.4 percent, big-eyed 14.6

Japan (Contd.):

Japan's Export Validations of Frozen Tuna and Tuna Loins to U. S., January-December 1964 with Comparisons									
Species	December 1964			January-December 1964			January-December 1963		
	Direct	Trans- shipped	Total	Direct	Trans- shipped	Total	Direct	Trans- shipped	Total
(Short Tons)									
Albacore, round	933	2,114	3,047	25,284	34,213	59,497	13,610	23,127	36,737
Yellowfin:									
Round	-	385	385	-	1,920	1,920	-	962	962
Gilled and gutted:									
20/100 lbs.	252	121	373	25,543	4,131	29,674	21,568	4,269	25,837
100 lbs. up	27	-	27	2,408	-	2,408	1,675	-	1,675
Dressed with tail	-	163	163	87	4,700	4,787	-	4,438	4,438
Filletts	5	-	5	38	12	50	326	132	458
Total	284	669	953	28,076	10,763	38,839	23,569	9,801	33,370
Big-eyed:									
Gilled and gutted	-	3	3	30	42	72	24	4	28
Dressed with tail	-	49	49	-	250	250	-	240	240
Filletts	-	-	-	37	3	40	7	41	48
Total	-	52	52	67	295	362	31	285	316
Bluefin, filletts	-	-	-	-	1	1	-	374	374
Skipjack, round	-	450	450	8	3,585	3,593	70	3,693	3,763
Loins:									
Albacore	522	-	522	3,805	-	3,805	2,998	-	2,998
Yellowfin	89	-	89	3,496	-	3,496	3,029	-	3,029
Bluefin	-	-	-	-	-	-	157	-	157
Total	611	-	611	7,301	-	7,301	6,184	-	6,184
Grand Total	1,828	3,285	5,113	60,736	48,857	109,593	43,464	37,280	80,744

Source: Japan Frozen Food Exporters Association.

percent, and tuna loins 18.0 percent, but skipjack was down 4.5 percent. (Fisheries Attache, United States Embassy, Tokyo, January 25, 1965.)

NEW DEVELOPMENTS ON SUSPENSION OF CANNED TUNA EXPORTS TO UNITED STATES:

Difficulties surrounding the conclusion of a workable arrangement between the Japanese tuna packers and exporters are said to be hampering the resumption of Japanese canned tuna in brine exports to the United States, which have been suspended since December 1964. Following the expiration on November 30, 1964, of the 1964 Exporters Agreement,

the Japan Canned Foods Exporters Association has been unable to develop a new export agreement acceptable to the Tuna Packers Association, thus precluding sales transactions between packers and exporters.

A series of meetings has been held in recent weeks by Japanese packers and exporters to find ways and means whereby they could transact business in the absence of an export agreement. At a meeting held on February 8, 1965, the Packers Association adopted a provisional sales plan whereby it would offer for sale 290,000 cases of tuna packed in brine to exporters for shipment in February. On February 9, the Exporters Association held a meeting to deliberate on the packers' proposal, and after much debate, voted to accept it.

Japan (Contd.):

On February 10, the Exporters Association filed an application with the Ministry of International Trade and Industry (MITI) for an export license. However, MITI, which on February 5 had developed a provisional standard governing approval of quota allocations to exporters for the period ending February 28, 1965, asserted that the Export Trade Control Law precludes approval of export quotas not calculated on the basis of a definite allocation standard, and thus is reported to have refused to license the export of the 290,000 cases agreed to by the packers and exporters. The firm attitude of MITI has created another obstacle to be overcome before sales can be consummated between packers and exporters who now fear this development may further delay canned tuna exports to the United States for sale during the Lenten season. (Suisan Tsushin, February 8, 10, 15; Suisan-cho Nippo, February 13, 1965, and other sources.)

Note: See Commercial Fisheries Review, March 1965 p. 79.

JAPAN TO ASK SOVIETS FOR 120,000-TON SALMON CATCH QUOTA FOR 1965 SEASON IN WESTERN PACIFIC:

Japanese and Soviet negotiators expected to meet March 1, 1965, in Tokyo, Japan, to set salmon and king crab catch quotas for 1965 in western Pacific waters regulated by the International Northwest Pacific Fisheries Commission. (Treaty waters north of 45° N. latitude are designated Area A; those south of 45° N. latitude are designated Area B). Japanese views on the negotiations were summarized in the Japanese periodical Tokyo Shim-bun, January 19, 1965, as follows:

(1) The Japanese Government, with industry support, will insist on a Japanese salmon catch quota in 1965 for Areas A and B combined of 120,000 metric tons (the same as in 1963, but up 10,000 tons from 1964). In support of their position the Japanese cite the theory of alternating lean and good salmon seasons which indicates 1965 will be a good year.

(2) The Soviets are expected to insist that salmon resources are declining. The Soviets will cite the poor Japanese salmon catch during 1964 in Area B which was 20 percent under the allowable 55,000-ton quota.

(3) The Soviet position on king crab fishing cannot be predicted because new factors have arisen such as the United States-Japanese agreement on king crab fishing in the eastern Bering Sea. In 1964, the northwest Pacific king crab production quota was set at 630,000 cases of 48 6.5-oz. cans (252,000 cases for Japan and 378,000 cases for the Soviet Union).

(4) An important factor in the background of the negotiations is that the Japan-Soviet fishery agreement is scheduled to be revised next year. In last year's negotiations, the 10 percent allowance above or below the quota permitted in Area B was deleted from the appendix to the fishery agreement. It is expected that in this year's negotiations, the Soviet side will again insist on stronger control measures, such as the entry into Area B of Soviet inspection vessels.

The Japanese were expected to insist that 1965 fishery negotiations be conducted separately from the proposed revision of the fishery agreement. (United States Embassy, Tokyo, January 25, 1965.)

VESSEL DECREASE PLANNED IN BONITO-TUNA FISHING FLEET:

Japan's catch of bonito and tuna has been showing a downward curve since 1962. Because of that, the Japanese fishing industry has started to study a plan to reduce the number of bonito and tuna fishing vessels by 20 to 30 percent from the present number of vessels.

According to a survey made by the Japanese Fisheries Agency, bonito and tuna catches showed an upward trend, with 546,000 metric tons in 1960, 651,000 tons in 1961, and 724,000 tons in 1962. Following the peak in 1962, the catch started declining due to a decrease in the resource, and also due to keen competition. The catch in 1963 was 690,000 tons and in 1964 it was estimated to be between 670,000 and 680,000 tons. On the other hand the vessel tonnage for that fishery has shown an increase with a total of 250,000 tons in 1961, 274,000 tons in 1962, and 306,000 tons in 1963. As a result, the catch per vessel has declined in the past 1 or 2 years.

Further, the sale to South Korea by Japan of 11 tuna vessels has recently been approved. Those vessels were to start fishing for bonito

Japan (Contd.):

and tuna in the South Pacific about the spring of 1965. As a result, competition in fishing for those species will be even greater. (San-kei, February 12, 1965, United States Embassy, Tokyo.)

Note: See Commercial Fisheries Review, September 1964 p. 82.

CANNED SHRIMP EXPORTS, 1964:

Japan's exports of canned shrimp for the 12 months of 1964 totaled 547,497 cases (converted to 24 1/2-lb. cans) valued at US\$3.4 million. This was a decrease of 119,580 cases or 17.9 percent below the previous year's exports and the value was down 4.4 percent.

Japan's canned shrimp exports to the United States during the year were much lower--168,910 cases valued at \$976,973 or down 57.3 percent in quantity and 51.6 percent in value as compared with the 1963 exports. The lower exports to the United States were attributed to unfavorable market conditions in 1963 stemming from a large United States Gulf of Mexico canned shrimp pack and low prices.

Canned shrimp exports to Great Britain in 1964 were more than double (up 108.4 percent)

those in 1963 and the value increased proportionally (up 154.8 percent), but exports to other countries were lower. (Fisheries Attache, United States Embassy, Tokyo, February 17, 1965.)

TRAWLING IN GULF OF ALASKA
LICENSED IN 1965:

The Japanese Fisheries Agency stated in early February 1965 that Japanese vessels would be licensed for trawling during 1965 in the Gulf of Alaska as far east as 135° W. longitude in an area north of 50° N. latitude. Japanese licenses for Gulf of Alaska trawling are to be issued to 20 trawlers (2 or 3 additional licenses may be approved later). The Japanese Fisheries Agency authorized 4 trawlers to enter the Gulf of Alaska fishery during February-May 1965. The remaining 16 trawlers are scheduled to enter in June and later months. Following are the names of the first group of trawlers with gross tonnage and scheduled entry into the Gulf of Alaska:

Takachiko Maru (3,490 gross tons) mid-February 1965.

No. 82 Taiyo Maru (2,800 gross tons) early March 1965.

Japan's Exports of Canned Shrimp, by Country of Destination, 1964

No. Cans per Case	Size	U. S.	Great Britain	Canada	France	Other Countries	Total
. (No. of Actual Cases)							
24 1-lb.	Small	-	100	-	-	1,970	2,070
24 1/2-lb.	"	44,631	112,002	5,136	10,285	6,756	178,810
24 1/4-lb.	"	2,130	15,943	-	-	-	18,073
48 1/4-lb.	"	250	5	-	500	120	875
24 1-lb.	Tiny	-	100	-	-	899	999
24 1/2-lb.	"	40,274	49,630	1,000	7,070	12,644	110,618
24 1/4-lb.	"	6,574	24,583	-	1,100	799	33,056
48 1/4-lb.	"	-	32,930	-	-	4	32,934
24 1-lb.	Broken	-	100	-	-	899	999
24 1/2-lb.	"	77,323	11,300	56,472	-	4,508	149,603
24 1/4-lb.	"	2,262	40,930	-	-	241	43,433
48 1/4-lb.	"	949	11,937	-	-	25	12,911
24 1/4-lb.	Mixed	-	12,658	-	-	-	12,658
. (Converted to Standard Cases of 24 1/2-lb. cans).							
Total 1964		168,910	265,461	62,608	18,405	32,113	547,497
Target for 1964		165,000	230,000	65,000	20,000	20,000	500,000
Total 1963		395,157	127,388	71,244	41,493	31,795	667,077
Value in US\$ 1964		976,973	1,750,893	335,611	115,880	195,331	3,374,688
Value in US\$ 1963		2,018,561	687,175	386,911	267,011	170,200	3,531,858

Source: Japan Canned Crab Sales Co. (Sales agent for canned shrimp).

Japan (Contd.):

No. 53 Akebono Maru (1,490 gross tons) early March 1965.

No. 12 Daishin Maru (2,900 gross tons) late May 1965.



Catch on the deck of a Japanese trawler operating in the Bering Sea and North Pacific.

The Japanese Fisheries Agency has stated that necessary regulatory measures will be issued for the Gulf of Alaska trawl fishery, including those needed to implement international agreements. (United States Embassy, Tokyo, February 4, 1965.)

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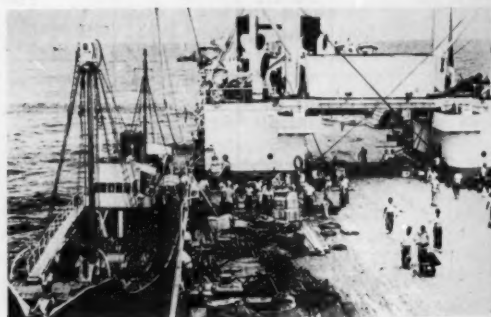
JAPANESE VIEWS ON ANTARCTIC WHALING SEASON QUOTA:

The outlook of the three Japanese whaling companies participating in the 19th Antarctic Whaling Expedition is not very promising, according to an article translated from the Japanese periodical Nihon Keizai, January 11, 1965. The reasons given are: (1) whale resources are decreasing throughout the world, especially in the Antarctic; (2) most nations affiliated with the International Whaling Com-

mission (made up of 17 fishing countries) are showing a mounting tendency toward reducing the total catch quota. . . . Depending on the progress of the proposed new whaling conference and the 17th Annual Meeting of the International Whaling Commission to be held at London in June 1965, it is expected that Japan's current seven-fleet whaling operation numbering three companies will be affected by a decision on reducing the number of vessels.

The whaling operations of the three Japanese whaling companies have consisted of 7 fleets since the 15th whaling expedition (1960/1961 season), with one company having 3 fleets and the other 2 companies each having 2 fleets. The total catch by the 7 fleets amounted to 5,980 blue-whale units (an average of 854 per fleet) in the 15th expedition, 6,574 (939 per fleet) in the 16th expedition, 6,150 (878 per fleet) in the 17th expedition, 4,600 (657 per fleet) in the 18th expedition, and a quota of 4,160 blue-whale units (594 per fleet) in the 19th expedition. It can be seen that the whale catches have been gradually decreasing, with that of the 16th expedition as the peak catch.

The Japanese whaling companies say that although operating expenses differ in each fleet according to depreciation, about 600 units is the minimum to meet expenses. The catches in the present expedition have already fallen below that figure. For the 7 fleets to carry out whaling operations in the future, a catch of at least about 4,160 blue-whale units, as in the 19th expedition, is considered necessary.



Whale catcher boat alongside Japanese factoryship to receive supplies and fuel.

At the Annual Meeting of the International Whaling Commission held in June 1964, the

Japan (Contd.):

United States, which is among the nonwhaling nations, proposed that the annual quota for the three whaling nations (Japan, the Soviet Union, and Norway) be 4,000 units in the 19th expedition, 3,000 in the 20th, and 2,000 in the 21st. As a result, that proposal was not adopted because of the opposition by the whaling nations, and also the opposition of former whaling nations such as the Netherlands and United Kingdom, and it was decided after consultation among the whaling nations that the quota for the 19th expedition would be 8,000 blue-whale units.

This is the first time in whaling history that the catch quota has not been officially decided upon at the annual meeting, although an agreement was reached through consultation among the whaling nations...

Against the tendency of reducing the Antarctic whale catch quota, the Japanese have filled the gap by purchasing whaling motherships from Norway, Great Britain, and the Netherlands with the whaling rights attached. But as it is felt that most foreign idle vessels with whaling rights have already been purchased, the Japanese Fisheries Agency also considers that steps for maintaining 7 Japanese whaling fleets by purchasing foreign motherships should no longer be taken.

As a result, one of the Japanese whaling companies is beginning to make a full-scale study of a plan to keep one of the present two fleets inactive. That company is considering plans such as the scrapping of motherships, reassignment of auxiliary catcher boats to whaling at the South Georgia Island base, and reassignment of auxiliary catcher boats to whaling at the South Georgia Island base, and reassignment of crew members.

The other 2 companies, on the other hand, have no intention of decreasing their vessels at present, and have not abandoned the idea of purchasing idle Norwegian motherships to maintain their present fleet organization. (Nihon Keizai, January 11, 1965, United States Embassy, Tokyo.)

JOINT FISHING ENTERPRISES WITH FOREIGN COUNTRIES:

Joint fishing enterprises between Japanese firms and foreign fishing firms cover a wide

range of operations including fishing for tuna and tuna canning, trawling, whaling, cold-storage bases, fish meal production, and pearl culture.

The Japan Fishery Agency has listed a total of 31 Japanese overseas fishing ventures, 30 of which were active as of January 1965. In addition, 10 Japanese firms are performing services for the pearl industry of Australia, Burma, Thailand, Malaysia, and the Philippines.

Japanese companies have 12 bases in operation in Central and South American countries (Venezuela, Brazil, Argentina, British Bahamas, Guatemala, Peru, Netherlands Antilles); 10 bases in Asia and Oceania areas (India, Ceylon, Malaysia, Burma, Ryukyu Islands, New Hebrides, Hong Kong, Fiji Islands); 4 bases in Africa (Ivory Coast, Nigeria, Madagascar; Las Palmas, Canary Islands); 2 bases in Europe (Portugal and Italy); 1 base in Israel; 1 base each in the United States and Canada. Some of the bases were established as early as 1953 and more recently in 1964. (Fisheries Attache, United States Embassy, Tokyo, January 29, 1965.)

FISHING VESSEL LICENSES IN EFFECT DECEMBER 31, 1964:

The worldwide range of Japanese fisheries is indicated by a recent summary of vessel li-



Fig. 1 - Wooden trawler with gear in water fishing for mothership in Bering Sea.



Fig. 2 - Japanese factoryship freezing shrimp and Pacific ocean perch in Bering Sea.

Japan (Contd.):

Vessels Licensed for Major Fisheries by Japanese Fishery Agency, as of December 31, 1964						
Fishery	Vessel Tonnage Limits	Total Vessels Licensed	Area of Operation	Principal Species in Fishery	License Period	License Expiration
	<u>Tons</u>	<u>Number</u>			<u>Years</u>	<u>Date</u>
Tuna fishery, other than mothership:						
High seas	Over 50	1, 329	Pacific, Indian, and Atlantic Oceans	Bonito, tuna, marlin, swordfish, shark	5	8/31/67
Near seas	Under 50	1/1, 850	Pacific Ocean--North of 10° N. latitude and west of 160° E. longitude			
Tuna fishery, mothership:						
Motherships	Over 500	45	Pacific, Indian, and Atlantic Oceans			
Catcher vessels	Less than 20	119				
Motherships	3, 000	3				
Catcher vessels	Over 50	165	Pacific Ocean--north of equator and east of 170° W. longitude; south of equator and east of 170° E. longitude.			
Salmon fishery, other than mothership	Over 30	283	North Pacific Ocean	Salmon	1	3/31/65
Salmon fishery, other than mothership	Over 10	369	North Pacific Ocean--south of 45° N. latitude			
Salmon fishery, mothership:						
Motherships	Over 5, 000	11	North Pacific Ocean			
Catcher vessels	Over 50	369				
Crab fishery:						
Motherships	Over 2, 000	4	West Kamchatka	King crab	1	12/31/65
Catcher vessels	Over 50	16				
Hanasaki vessels . . .	Over 20					
Motherships	Over 2, 000	3	Bering Sea		1	12/31/64
Catcher vessels	Over 50	13				
Hanasaki vessels . . .	Over 20	27				
Trawling, other than mothership	Over 15	1, 147	Offshore areas near Japan (east of 128° , 40° E. longitude)	Halibut, cod, Atka mackerel, Zuai crab	5	7/31/67
	15-550	785	East China Sea--Yellow Sea (west of 130° E. longitude)	Croaker, seabream, halibut, flounder	5	8/31/67
	15-3, 000	201	Bering Sea, Africa, New Zealand	Cod, rockfish, seabream, cuttlefish, squid, octopus, croaker, shrimp, lobster		
Trawling, mothership:						
Motherships	1, 400	14	Bering Sea	Halibut, flounder, cod, croaker	1	1/31/65
Catcher vessels	50-500	228				
Long line and gill net .	100-463	19	Bering Sea	Cod, croaker	5	8/31/67
Purse-seine (large and medium) .	Over 40	734	North Pacific, Japan Sea, East China Sea, and Yellow Sea	Sardine, horse mackerel, mackerel, tuna	5	10/31/67
Whaling, coastal:						
For large whales . . .	Less than 450	22	Off coast of Japan	Baleen whales (excluding minke whales), sperm whales	5	11/30/67
For small whales . . .	Less than 40	19	Off coast of Japan	Mink whales, toothed whales	5	10/31/69
Whaling, mothership:						
Motherships	10, 000	7	Antarctic	Baleen and sperm whales	5	10/11/66
Catcher vessels	300	91				
Motherships	10, 000	3	North Pacific			
Catcher vessels	300	21				

1/Entry into fishery not yet approved.
Source: Japanese Fishery Agency.

Japan (Contd.)

censes issued by the Japanese Fishery Agency. (Fisheries Attache, United States Embassy, Tokyo, December 23, 1964.)



Malaysia

JOINT FISHING VENTURE
WITH JAPAN PLANNED:

A joint Japanese-Malaysian fishing venture was proposed during a visit to Southeast Asia in early 1965 by a 29-man Japanese trading mission from Kochi Prefecture. The Mission spent two days in Kuala Lumpur where it met with the Malaysian Assistant Minister of Commerce and Industry, and members of various Chambers of Commerce and manufacturers to discuss and investigate local trade conditions. Details of the proposed joint venture are expected to be worked out in the near future.

Under the proposed venture, the Kochi Prefecture fishing fleet would fish in the Indian Ocean and in Malaysian waters. The Prefecture would offer to the Malaysian Government scholarships on marine and fisheries. The Japanese further expressed their willingness to send to Malaysia experts on trawler fishing to help the Malaysian Fisheries Department. It is expected that a group of Japanese businessmen connected with small industries will visit Kuala Lumpur during summer 1965 for discussions on working out fishery and other joint ventures. The leader of the Japanese Mission stated that their visit had revealed tremendous potentialities in Malaysia for foreign businessmen to set up joint ventures. (United States Embassy, Kuala Lumpur, January 26, 1965.)

Note: See Commercial Fisheries Review, February 1964 p. 76.]



Mexico

SHRIMP CATCH ON WEST COAST
POOR DURING 1964/65 SEASON:

Because of poor catches since the Mexican West Coast shrimp fishing season started in September 1964, at least 300 shrimp vessels operating out of Guaymas in the State of Sonora, Mexico, discontinued fishing as of mid-February 1965. The shrimp catch there

has so far been at least 20 percent less than at the same time last season and the vessel operators are reported as having no intention of resuming fishing this season. The lower income to the vessel operators and fishermen combined with State and Federal taxes precludes any further operation of the vessels.

Probably the most restrictive condition imposed on the fishing industry has resulted from the terms of the contracts between the vessel owners and the cooperatives, the members of which comprise the crews. The contracts provide that the vessel owners receive 55 percent of the income while the 45-percent balance goes to the cooperatives. During a good or average season, the owners report they can operate adequately with that income-splitting ratio, even though the cooperatives bear only about 37 percent of the operating costs. But during a poor season such as the present one, both the owners and the cooperatives operate at a disadvantage although the owners claim they bear the greatest burden. The contracts are due to be renegotiated in September 1965 and in all likelihood the owners will use this season's (1964-65) difficulties as a lever in their attempts to lower the percentage received by the cooperatives, or to raise the proportionate level of the expenses assumed by the cooperatives.

Appeals have been made to the Governor of the State of Sonora to reduce state-imposed taxes. He has also been asked to intervene on behalf of the shrimp industry with federal authorities to reduce federal taxes. So far no action has been taken on reducing such taxes. Relations between the vessel owners and the cooperatives are cordial and they appear to be working together in their efforts to find a temporary solution to some of their problems.

Reports from other sections of the shrimp fishing industry confirm that all other Mexican West Coast shrimp ports share the same problem. Fishing has been poor ever since the season opened, all the way from the Gulf of California to the Guatemala border. Although the open season runs until May 1965, everyone is said to be discouraged. But for the higher shrimp prices, the poor fishing during the present season would have resulted in a much worse situation.

Unlike the 1963/64 season when vessel owners and cooperatives were in bitter disagreement, all now realize that they share a mutually difficult position and must work together.

Mexico (Contd.):

Improvement in the present economic condition of most of the cooperatives is being considered in high government levels. (Fishes Attache, United States Embassy, Mexico, February 17, 1965.)



Nigeria

U. S. FIRMS PLAN AFRICAN FISHING VENTURES:

At least four United States groups are interested in commercial fishing off Nigeria on the African Atlantic Coast. Two separate U. S. firms were in Nigeria early in 1965 carrying out shrimp fishing surveys. (Shrimp off Nigeria are of the *Penaeus duorarum* species and correspond to Gulf of Mexico pink shrimp, according to a marine biologist with the Food and Agriculture Organization.)

Following is a summary of the plans of four U. S. groups involved in Nigerian fishing projects:

(1) Two 70-foot shrimp trawlers belonging to a U. S. businessman completed a 10-day trial fishing run off Nigeria on January 20, 1965. During the trial run, the 2 trawlers each made about 17 drags of from 45 minutes to 4 hours duration. Area covered by the vessels was from Lagos to east of the Bonny River mouth. Each vessel's catch--which was exploratory and not representative of a typical commercial load--amounted to about 1,000 pounds of heads-off shrimp and 5,000 to 6,000 pounds of mixed fish. Size of shrimp averaged 21-25 count a pound heads-off. The best catches were in depths of from 10-20 fathoms; there was little difference between day or night fishing.

The U. S. businessman who conducted the shrimp survey in January is backed by a New York fisheries firm and he is associated with an Iraqi concern with Nigerian interests. He plans to bring to Nigeria 4 additional trawlers of up to 80 feet in length. Shrimp grading and freezing equipment is to be installed on the vessels. Their catch would then be processed at sea and brought to Lagos for transshipment to the United States. Until the processing equipment is installed, catches will be sold to a Nigerian cooperative at Apapa for local distribution.

(2) Another U. S. businessman arrived in Nigeria on January 10, 1965, to conduct a 2-month shrimp survey under an investment survey grant from the U. S. Agency for International Development (AID). He brought in several 20- to 30-foot nets specially designed for heavy mud bottoms, such as are common off the Niger River delta. The nets will be rigged aboard a 50-foot trawler loaned by the Nigerian Government. The survey will be carried out along the entire Nigerian coast. Special attention will be given to the area off Calabar. If the survey proves the feasibility of a large-scale operation, U. S. interests propose to establish a Nigerian shore base (packaging, freezing, and cold-storage plants) which would involve an investment of between US\$3 to 4 million over a 2-year period. Calabar or the Port Harcourt area have been mentioned as possible locations for the base.

If it develops as planned, the project could employ 50 steel shrimp trawlers, some of which might be built locally. Twenty shrimp vessel captains would be brought in to train Nigerian crews.

Pioneer status for the venture may be granted by the Nigerian Government, which would clear the way for production to begin within 6 months. Full production could be reached within a year.

Capacity of the operation as planned would be about 5 million pounds of frozen shrimp annually. Talks have been held with a shipping company to determine if it has adequate refrigerated vessels to haul 200,000 pounds of frozen shrimp every 2 weeks from Nigeria to the United States. Assurances were given that this could be done, but the initial freight rate quoted (7 U.S. cents a pound) might cause problems.

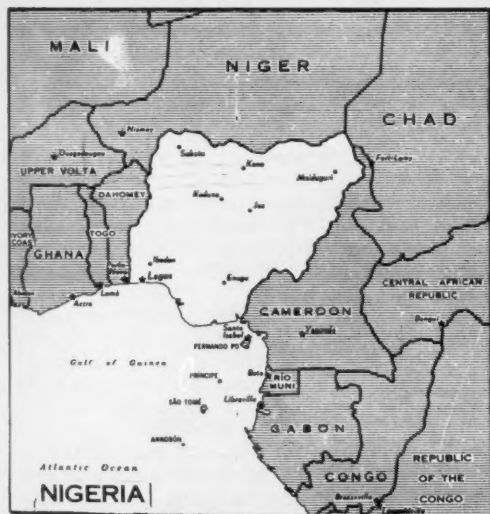
(3) Other U. S. groups are known to be planning fishing ventures in Nigeria. A large U.S. company in Gloucester, Mass., will shortly undertake an AID investment survey in Nigeria. If feasible, the company will undertake a seafood processing operation in Nigeria involving an investment of up to \$1.5 million, excluding fishing vessels.

(4) A New York firm announced on December 20, 1964, in the New York Times the conclusion of an agreement to invest \$24 million during the next 10 years in a fishing complex in Western Nigeria. (United States Embassy, Lagos, January 29, 1965.)

Nigeria (Contd.):

EXTENDED SURVEY TO BE MADE OF SHRIMP RESOURCES:

A shrimp trawling survey of Nigerian coastal waters was to be started about February 1, 1965, by the Federal Fisheries Service of Nigeria. The survey, to be carried out by the research vessel *Kiara*, will extend over a one-year period covering 2 rainy seasons and 2 dry seasons, and will cover the Continental Shelf out to a 100-meter (328-foot) depth. Transects will be about 15 miles apart, 6 stations to be made on each transect. The survey is designed to provide more detailed information for Nigerian waters to supplement that obtained from the Guinean trawling Survey conducted by the Commission for Technical Cooperation in Africa (CCTA) for the coast of the Gulf of Guinea from Dakar to Pointe Noire. (Results of the Guinean Trawling Survey are expected to be published late in 1965.)



The results of this survey of Nigerian shrimp resources will be of interest to the several United States and Nigerian companies now participating or concerned with the development of a shrimp industry in Nigeria. (Regional Fishery Attache, United States Embassy, Abidjan, January 27, 1965.)

Note: See *Commercial Fisheries Review*, September 1964 p. 86; August 1964 p. 1.

TWO SHRIMP TRAWLERS ORDERED FROM JAPAN:

Two shrimp trawlers were ordered from a Japanese shipyard by a Nigerian fishery

company at Lagos. The trawlers are expected to be delivered about July 1965 and will fish in Nigerian waters under Japanese captains and engineers, but probably with Nigerian crews. One of Japan's largest fishing companies has agreed to buy all of the shrimp production from the two new vessels for the first five years of the operation. Packing and freezing of the shrimp will be done at the Lagos plant.

This is another indication of the rapidly growing interest in the shrimp resources of Nigeria which are being actively investigated by United States firms. (Regional Fisheries Attache, United States Embassy, Abidjan, January 27, 1965.)

**North Korea****DUTCH-BUILT FREEZER FISH-FACTORY VESSEL DELIVERED TO NORTH KOREA:**

A new freezer fish-factory vessel of 7,000 deadweight tons built by a Netherlands shipyard in Rotterdam was reported to have been delivered to a North Korean firm in Pyongyang on January 30, 1965.

Daily freezing capacity of the new vessel is 100 metric tons in vertical-plate freezers and 20 tons in a freezing tunnel. Cold-storage capacity of the vessel is 7,500 cubic meters (about 265,000 cubic feet). The vessel is powered by a diesel engine of 6,000 horsepower. (United States Embassy, The Hague, February 5, 1965.)

Note: See *Commercial Fisheries Review*, November 1964 p. 98; April 1964 p. 76.

**Norway****EXPORTS OF CANNED FISH, JANUARY 1-OCTOBER 31, 1964:**

Norway's total exports of canned fish during January 1-October 31, 1964, were up about 6 percent from those in the same period of 1963, due mainly to larger shipments of canned brisling and canned soft herring roe. There was a slight decline in exports of canned small sild sardines.

The packing of sild sardines in 1964 started in early May and by November 21, 1964, a total of 662,206 standard cases of small sild had been packed, compared with 679,717 cases in the same period of 1963. Most of that pack

Norway (Contd.):

was smoked sild. Unsmoked sild accounted for only 48,659 cases of the 1964 pack and 49,044 cases of the 1963 pack.

Norwegian Exports of Canned Fish		
Product	1/ Jan. 1-Oct. 31, 1964	Jan. 1-Nov. 2, 1963
 (MetricTons). . . .	
Brisling	5,402	4,575
Small sild	11,937	12,225
Kipperd herring . . .	2,740	2,625
Soft herring roe . . .	1,089	672
Sild delicatessen . . .	410	405
Shellfish	1,443	1,321
Other fishery products	2,610	2,422
Total	25,631	24,245
1/ Preliminary.		

As usual, the brisling canning season closed October 15. The 1964 brisling pack totaled 377,801 standard cases, compared with 282,039 cases in 1963.

Mackerel landings in 1964 for canning purposes totaled 1,722 tons as of November 14, 1964, compared with 1,577 tons in the same period of 1963.

For January to August 1964, Norwegian total canned fishery exports of 19,400 tons were valued at Kr. 98 million (US\$13.7 million), compared with 17,400 tons valued at Kr. 88 million (\$12.3 million) in January-August 1963.

The United States was the main market for Norwegian exports of canned fishery products in January-August 1964 with 6,495 tons valued at Kr. 35.2 million (\$4.9 million), followed by the United Kingdom with 5,397 tons valued at Kr. 29.4 million (\$4.1 million). Other markets were the South Africa Republic with 1,160 tons, Czechoslovakia with 1,089 tons, Australia with 1,021 tons, and Canada with 568 tons. With the exception of sales to the United States, canned fish deliveries to all major markets in January-August 1964 were running ahead of the same period in 1963. Shipments to the United Kingdom were up 1,317 tons and Kr. 8 million (\$1.1 million). The decline in shipments to the United States was 270 tons in quantity and Kr. 2.7 million (\$378,000) in value. (Norwegian Canners Export Journal, December 1964.)

FISHERY TRADE WITH EAST GERMANY, 1964 AND 1965:

According to press reports, Norwegian firms plan fishery exports to East Germany in 1965 totaling about Kr. 31 million (US\$4.3 million), which would be about the same as in 1964. The 1965 fishery exports to East Germany are to include: fresh and processed fish valued at Kr. 15 million (Kr. 16.5 million in 1964); fish meal Kr. 10 million (Kr. 8 million in 1964); canned fish Kr. 5 million (same as in 1964); and sperm oil Kr. 850,000 (Kr. 1.8 million in 1964).

Fishing vessels are included on a list of items which Norway may import from East Germany. (United States Embassy, Oslo, December 16, 1964.)

GENERAL AGREEMENT ON GOVERNMENT SUPPORT TO FISHERIES APPROVED:

The General Agreement on government support to Norway's fisheries was approved June 3, 1964, by a unanimous vote of the Norwegian Storting. The agreement establishes that the fishermen's union, "Norges Fiskarlag," shall act as the sole representative of the fishermen in negotiations with the Government on state support and other measures to increase the income of fishermen. Previously, such negotiations have taken place between the Government and the various marketing organizations of the fishermen.

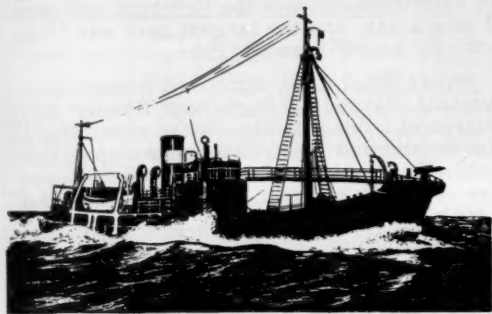
The General Agreement comprises general rules concerning the negotiations, the statistical basic material to be used, the conditions necessary to demand negotiations to be opened, the framework of the support measures, etc. The agreement further contains specific rules for the negotiations to take place during the first five years. These rules comprise modernization measures to increase the profitability of the fisheries, as well as social measures to be carried through during the period covered. (United States Embassy, Oslo, January 18, 1965.)

EARLY RESULTS OF 1964/65 ANTARCTIC WHALING SEASON:

The Norwegian whaling fleet produced only 14,195 barrels of whale oil and 21,315 barrels of sperm oil during the first 15 days of operations in the 1964/65 Antarctic whaling exped-

Norway (Contd.):

ition, reported the Norwegian Whaling Association. This compares with 27,405 barrels and 20,592 barrels, respectively, as against the first 17 days of the 1963/64 season.



Norwegian whale catcher boat used in Antarctic.

It is conjectured that the Norwegians will probably not catch their quota of whales for the 1964/65 season. (United States Embassy, Oslo, January 18, 1965.)



Pakistan

FAO EXPERT FINDS GREAT SCHOOLS OF CATFISH IN GANGES DELTA AREA:

Prime quality catfish that feed on rice have been found in East Pakistan in mile-wide schools over fishing grounds practically untouched by hook or net. The discovery was reported by an Icelandic master fisherman with the Food and Agriculture Organization (FAO) who recently completed a 3-year assignment in Pakistan. He found immense catfish schools in the Shahbazzpur River of Pakistan while conducting exploratory fishing from a 72-foot vessel. "We had an echosounder on board and at first I couldn't believe the readings," he said. "The whole river bottom seemed to be alive with fish."

At one point, using a bottom trawl, the FAO expert and his Pakistani companions caught 5 tons of catfish in a short period of minutes. The team fished the Shahbazzpur off and on from April through November 1964 and caught an average of 677 pounds of catfish an hour. The team averaged 618 pounds an hour during April, 741 pounds in May, and 1,902 pounds in November. The catfish caught

ranged from 1 to 43 pounds in weight. In East Pakistan and neighboring east India the fish is known as "pangas."

"The good thing is that the Shahbazzpur 'pangas' feeds on rice floating down the river. This makes its meat particularly clean and tasty," the FAO expert said. The rice comes from paddies along two of Asia's great rivers, the Ganges and the Brahmaputra. During June, July, and August the southwest monsoon hits the foothills of the Himalayas and causes one of world's heaviest rainfalls. The Brahmaputra floods then and covers the rice fields. Millions of rice grains are washed into the rivers.

The rice floats downstream and flows into the Shahbazzpur and other rivers of the Ganges Delta where it gathers in underwater gullies and pits, and attracts the rice-eating fish in great numbers. In December 1964, a Pakistani commercial fishing vessel, the *M.F.V. Sayera*, was guided to the Shahbazzpur where it caught 27,480 pounds of catfish in 3 hours and 20 minutes of trawling.

The FAO master fisherman says he has no doubt that these grounds, all but untouched by commercial trawling operation, could supply several thousand tons per year of top-quality catfish to protein-hungry areas of East Pakistan. "The East Pakistanis and their nearby Indian neighbors already like catfish," he said. "It is one of the most popular local fish. I've never seen finer catfish than those that feed on rice in the Ganges Delta." (Food and Agriculture Organization, Rome.)



Peru

ANCHOVY POPULATION PRESENTLY SHOWS NO SIGN OF DEPLETION:

The explosive growth of the anchovy (*Engraulis ringens*) fishery off the coasts of Peru and Chile has caused concern regarding the status of that resource. In 1963, over 7 million metric tons of anchovy were landed in the two countries, and it is estimated that the catch was even greater in 1964. Recent studies carried out by the Marine Resources Research Institute in Peru have shown no indication of overfishing to date. Experience in the anchovy fishery, however, at high levels of production has not extended over a sufficient number of years to enable an authoritative de-

Peru (Contd.):

termination of the maximum sustainable anchovy yield.



Portugal

1964 SARDINE FISHING SEASON REPORTED ONE OF BEST:

Portugal's 1964 sardine fishing season closed January 15, 1965, with reports that the catch was one of the largest and most profitable in several years. Complete data for the 1964 sardine catch are not yet available.

According to press reports from Oporto, the port of Matosinhos continues to be the largest sardine fishing center in Portugal. Some 120 fishing vessels operated out of that port during the 1964 season. The new sardine fishing season is scheduled to open on April 16, 1965. (United States Embassy, Lisbon, January 30, 1965.)



Rumania

TWO LARGE STERN TRAWLERS FISH OFF NORTHWEST AFRICA:

Rumania's two stern trawlers, the Costanta and the Galati, started fishing off the northwest coast of Africa in January 1965. Up until that time they had fished in the Norwegian Sea near the Faroe Islands.

Both vessels have a displacement of 3,600 gross tons, are over 280 feet long, and have a speed of 13.7 knots. They are considered the largest stern trawlers in the world. They can trawl at the bottom or in midwater, have a freezer holding capacity of 58,269 cubic feet and a fish-meal holding capacity of 18,187 cubic feet. Each vessel carries two 20-gross-ton boats for purse-seining and long-lining.

Rumania's first two deep-sea fishing trawlers were ordered from a Japanese shipyard at Hitachi in October 1962, at a cost of US\$2.8 million for each vessel. The terms were a 30 percent down payment and the balance payable in semiannual installments over a period of 5 years. The vessels were delivered in the spring of 1964.

Under the terms of purchase, fishing trials could not be conducted in Japanese waters. The Costanta (with 20 Japanese instructors aboard) went on its maiden voyage to New Zealand, while the Galati fished with the Soviet ocean perch expedition in the Western Aleutians. In New Zealand's western waters, the estimated catch of the Costanta was about 80 tons a day, and the largest haul was 15-20 tons in 2 hours' trawling time.

Unlike other East European countries, Rumania planned her high-seas fishery development independently. After consulting with British and Western German shipbuilding architects, the Rumanians draw up their own trawler design and then contracted with Japan to build the vessels.

In late 1964, the fishery ties between Japan and Rumania were further strengthened with the conclusion of long-term contracts for delivery by Japan of large quantities of frozen mackerel.

Note: See Commercial Fisheries Review, July 1964 p. 55; March 1964 p. 67.



Uganda

COMMERCIAL FISHERY BEING DEVELOPED:

With its 13,600 square miles of major lakes and many rivers and small lakes, Uganda, Africa, has a very considerable potential for the development of a commercial fishing industry. Actual commercial fishing only started in 1910 when gill nets were imported for use on Lake Victoria. Prior to that, fishing was on a subsistence basis involving hooks, spears, basket traps, and similar locally-made devices. Records of early commercial catches are sketchy but it is known that until 1927 only the Lake Victoria fishery was developed to any extent and then primarily, for only one kind of fish, Tilapia esculenta (locally called ngege).

The potential importance of the lake fisheries was recognized by surveys between 1927 and 1931. The recommendations based on the surveys resulted in the creation of a Fisheries Section of the Game Department in 1931. It became a separate department in 1961 responsible for developing and controlling the fisheries. Its headquarters is in Entebbe on Lake Victoria and it maintains a 30-acre fish farm at Kajansi and has officers in the various fishing areas. Its aim is to obtain the maximum sustainable yield of fish to supply both home and export markets.

Many waters which naturally did not contain fish of commercial value were stocked with tilapia. The best example of those early plantings of fish are those of the Koki lakes and Lake Nakivalli which were stocked in 1935 and now regularly produce 2,000 tons of Tilapia nilotica a year.

PRODUCTION AREAS: The main producing areas in Uganda are Lakes Victoria, Edward, George, Albert, and Kyoga, where gill-netting, beach-seining, basket-trapping, and long-lining are the methods most commonly used. Ngege (Tilapia) is still the main econom-

Uganda (Contd.):

ic species but many other species of fish find a ready sale including Nile perch, catfish, lungfish, elephant-snout fish, and the sardine-sized *Haplochromis*. The crocodile trapping industry produces a few thousand skins each year for overseas and local markets.

Lake	Area Sq. Miles	1961				1951
		Quantity		Value		Quantity
		Metric Tons	£	US\$	Metric Tons	
Victoria	10,961	23,000	1,150,000	3,220,000	10,000	
George	104					
Edward	235	10,451	418,040	1,171,000	5,622	
Kyoga	880	12,866	402,500	1,127,000	2,500	
Albert/Albert Nile	1,385	10,000	300,000	840,000	4,000	
Lake Nakiavalli						
Complex	57	1,935	77,400	217,000	1,200	
Other lakes, dams, rivers and fish ponds	73	1,936	58,080	162,000	500	
Total	13,695	60,188	2,406,020	6,737,000	23,822	

The fisheries are almost entirely African-run and 20,000 Africans find employment in the catching and distribution segments of the industry.

PRODUCTION AND CONSUMPTION: In 1962, Uganda's fishery production totaled 63,500 metric tons with a landed value of £2.5 million (US\$7 million) and a value at the retail level of \$9.8 million. Uganda's exports in 1961 of processed fish from the western lakes to the Congo Republic dropped by 400 tons in quantity and £100,000 (US\$280,000) in value as compared with 1960, due in part to difficulties in arranging currency exchange. Many fishermen have now turned their attention to markets in Uganda and there has been a steady increase in sales of fish produced on Lake Albert to Lango, Acholi and West Nile districts. Smoked fish processed from fish caught in Lakes George and Edward sold to Kampala and other markets in Buganda has eliminated the importation of fish from Tanganyika which was formerly imported by Uganda in large quantities. Elsewhere unsettled political and economic conditions in East Africa have impeded Uganda's expansion of fishery products sales, especially for fish fillets, which are sold mainly to the immigrant communities. Competition of supplies of frozen and cured sea fish and foods from overseas sources have also had their effect on Uganda's export potential. At the end of 1961 the most severe floods on the lakes of this country affected fishing and caused fishermen to evacuate their lakeside villages, necessitated covering the seining beaches, hindered the drying of fish, and disrupted communications. Local sales of fish were also severely affected because lake levels in some cases were more than 11 feet above average and resulted in fish spreading far inland in low areas

Item	1961				1951
	Quantity		Value		Quantity
	Metric Tons	£	US\$	Metric Tons	
Salted and smoked fish	2,350	293,585	822,000	3,137	
Frozen fillets	333	91,000	255,000	-	
Fish meal	157	5,535	15,000	-	
Crocodile skins	1/	28,000	78,000	1/	
Total	2,840	418,120	1,170,000	3,137	

1/ Data not given.

to the extent that farmers were fishing in their own backyards.

Annual consumption of fish in Uganda now averages 18.6 pounds per capita as compared with 25 pounds in the United Kingdom. But there are wide variations between districts; the Batoro still eat very little fish because of local prejudices whereas surveys show that the Acholi in the Gulu area now eat over 50 pounds per capita a year. The prejudices against fish eating which previously affected Kigezi, Ankole, and Bunyoro are breaking down rapidly.

MARKETING AND PROCESSING: In general, marketing is done by itinerant fish dealers of whom some 7,000 were licensed in 1961. Although the majority still deliver their fish by bicycle, an increasing number are using motorcycles, truck, or rail transportation. In the Lake George-Edward region, marketing is a commercialized operation and there are two modern fish-processing plants. One of the plants is at Kasenyi on Lake George and is equipped with blast and plate-freezers, salting vats, and a fish-meal plant. The second plant is at Katunguru on the Kazinga Channel which has similar facilities. Both plants supply fresh and quick-frozen fish by rail and road to markets throughout East Africa and salt-cured fish to the Congo, and also to local markets. African processors at Katwe on Lake Edward have invested considerable sums in permanent salting vats and hot-smoking pits. At the end of 1961, a third fish-freezing plant for the area was built at Kabatoro near Lake Edward to produce whole frozen fish for sale through the company's own retail-wholesale fish shop in Kampala.

Many improvements in the marketing segment of the fishing industry have taken place in the last three years by the building of warehouses and the installation of basic services at major landing points, and also by improvements to road communications to the lakes. The improvements have resulted in the processing of fish under more sanitary conditions and its transport in sizable quantities from the lake-shore to the major markets. In 1961 a new fish market at Mases in Jinja was opened and the good facilities there were used to advantage by both fishermen and fish dealers. At Katwe on Lake Edward a start was made on the installation of a piped water supply to both the residential area and the fish-curing establishments. Plans were approved and funds were voted for the construction of a fish market at Soroti and for dried fish stores in Teso and West Nile. A new all-weather road connecting Ntoroko to Fort Portal was built in 1962 to open up the fishing industry at the south end of Lake Albert.

VESSEL CONSTRUCTION: There are about 5,800 licensed fishing canoes in Uganda. The Fisheries Department has encouraged the use of powered canoes to increase their range and there are now some 1,400 canoes with outboard engines, the remainder being hand-propelled. The Uganda Credit and Savings Bank provides loan facilities to reliable fishermen for fishing gear, vessels, curing facilities, and transportation.

Instructions in vessel building are given at Masindi Technical School. Students who have completed the course either set up their own boatyard or join one that is already established.

FISHERIES RESEARCH: There has been a considerable program of fisheries research in Uganda which

Uganda (Contd.):

has mainly been carried out by the East African Fresh-Water Fisheries Organization at its headquarters and laboratory in Jinja. Since its establishment in 1948, that organization has published considerable information on the biology and ecology of fish and of the general hydrology and productivity of the lakes.

Since 1957, the Food and Agriculture Organization (FAO) has had some of its officers assist the Uganda Fisheries Department in studying specific problems. The FAO staff consists of a statistician, 3 fisheries biologists, an economist, and a fish-processing expert.



A U. S. marine biologist, assigned by FAO in 1958 to Uganda, worked with a team of assistants provided by the Government of Uganda to evaluate the fishery resources of Lake George. Pulling in gill net used to sample the lake's fish resources.

Preliminary experiments were carried out on Lake Victoria on the catching and canning of *Engraulis* which process much more easily than *Haplochromis*, and which are plentiful in the Entebbe area.

FISH STOCKING: Uganda has over 700 dams built for cattle watering and in 1961 fish stocking continued in those and other waters. Some 1,000 *Tilapia nilotica* were planted in Lake Victoria at Entebbe. Nile perch were transferred to dams at Nyapea in West Nile and at Kawanda Research Station. In Lake Kyoga, where Nile perch were first planted in 1954, catches of that species were made regularly in all areas, the largest specimens claimed to be over 100 pounds in weight. In Lake Victoria, Nile perch were first reported there in 1960 and were believed to have originated from Lake Kyoga. More of them were later seen in commercial catches indicating that those fish had bred. All were in the Jinja area and the largest fish weighed 11 pounds.

FISH FARMING: Fish farming which now makes use of the weed-eating *Tilapia zillii* has made rapid progress since the Kajansi Fish Farm was established in 1953. By 1961, the number of ponds had increased from 7,153 to 7,593. It is estimated that only about 10 percent of the total potential catch of one million pounds of fish from those ponds is being realized. Work has been centered on persuading the farmers to feed their fish regularly with sweet potato tops and to weed out surplus fry. About 10 percent of the farmers are now maintaining and exploiting their ponds and stocks properly. Commercial fishing of dams stocked

in previous years with *Tilapia* from the Kajansi Fish Farm have gathered momentum and in 1961 a number of dams in Ankole, Mubende, and Masaka districts produced between 5 and 50 tons each. At Kajansi, work is being concentrated on breeding carp (*Cyprinus carpio*). Excellent results were achieved and not only were breeding stocks supplied to a number of selected African farmers and ponds at institutions but a small quantity also were frozen for sale in Kampala and Nairobi. The frozen carp found a good market acceptance and the demand became greater than supplies.

Since 1959 considerable financial and material aid has been given by the United Nations International Children's Emergency Fund (UNICEF) to the Uganda Fisheries Department for the establishment of fish ponds at schools in Bukedi district and for the general improvement of fisheries. In 1961 the Bukedi Plan made good progress and large fish ponds were completed at five schools and all standing water stocked with fish.

SPORT FISHING: Uganda provides good sport fishing and local interest in angling is encouraged by the Uganda Angling Association. Black bass, which were stocked by the Fisheries Department in Lake Mutanda in 1960, bred during 1961 and became well established. There were indications that breeding had also taken place near Fort Portal in Lake Saka which was stocked with black bass at the same time. (Fisheries Department, Government of Uganda.)

Note: See *Commercial Fisheries Review*, August 1963 p. 109.



Uruguay

FUR SEAL INDUSTRY:

Several coastal islands off Uruguay (Isla de Lobos near Punta del Este and four smaller islands off the Cabo Polonio) are the home of extensive fur seal herds. The herds consist of two-coated seals ("dos pelos") and one-coated seals ("un pelo"). The Uruguayan Government agency in charge of commercial fishing and oceanographic research (SOYP) has a complete monopoly over harvesting the fur seals on the coastal islands. The following description of that industry was furnished by SOYP:

About 170,000 seals of two coats (a short fine coat and a long rough coat) and 35,000-40,000 seals of one coat (a long rough coat only) breed on Uruguay's coastal islands. The two-coated seals are more prolific and breed in the higher rocky parts of the islands, while the one-coated seals breed on the lower beaches. The one-coated seals remain in close proximity to the mouth of the Rio de la Plata at all times, while the two-coated seals range over a considerably wider stretch of the adjacent South Atlantic areas.

Uruguay (Contd.):

SOYP estimates that in 1964 it harvested 8,000 skins from the two-coated seals and between 2,000 and 2,500 from the one-coated species. The future annual harvest may be increased slightly if the overall population increases.

SOYP reports that up to 1964 it annually sent approximately 2,000 raw seal skins on consignment to a fur company in the United States and sold outright to a London firm about 3,000 skins. Now, however, SOYP has opened a new plant in Uruguay and hopes that it will be able to process all raw seal skins locally. As a result, SOYP has sold Industria Lobera del Uruguay, S.A. (ILUSA), an association of four leading furriers in Uruguay, 8,000 pelts from the 1964 harvest with the understanding that SOYP will do the processing.

SOYP harvests only male seals measuring between 76 and 100 centimeters (about 30 to 39 inches). The harvest, which begins in June when the maximum number of seals are on the islands, is limited to seals between 8 months and 3 years in age.

SOYP officials estimate that raw seal skins of average quality sold on the local market in Uruguay bring 225 to 250 pesos (\$9.40-\$10.40) and the finished skins about 400 pesos (\$16.70). The best seal skins are sent abroad and sold at higher prices on the international market. (United States Embassy, Montevideo, December 16, 1964.)

Note: Uruguayan pesos 24.15 equal US\$1.00.



U.S.S.R.

COD BLOCKS GO TO WEST GERMANY AND OTHER COUNTRIES:

Soviet cod blocks traded to West Germany under a barter agreement are being reexported to France, Australia, and the United Kingdom. A total of 10,000 metric tons of the Soviet cod blocks produced in the North Atlantic, presumably on Georges Bank or the Grand Banks, are to go to West Germany under the barter agreement. The 13½- and 16½-pound blocks in a recent Soviet shipment to Hamburg, Germany, were reported to be of excellent quality and workmanship. However, it was reported that earlier shipments

of the fish blocks had some physical defects, including the presence of bones.

A shipment of 102,900 pounds of Soviet-produced frozen cod blocks arrived at Boston, Mass., in February 1965, together with frozen fishery products from West Germany. It was the first shipment at Boston of cod blocks from Soviet-caught fish in the North Atlantic. The New England fish-processing firm handling the blocks reported them as of a good quality and that prices were at the same level as for the Canadian product. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 3, 1965, and other sources.)

FISHING GOALS EMPHASIZE HIGH-SEAS FLEET EXPANSION:

The Chairman of the State Fisheries of the Soviet Union said in an interview that fishing on the high seas and at greater depths were their main aims for the future. Their 1965 fisheries catch target would be 5.6 million metric tons.

In the past 15 years, said the Chairman, the Soviet fishing fleet had doubled in size, and its engine power had increased fourfold. In the old days, a fishing trip of 1,500 miles was considered the limit, except for whalers, but today, ocean-going fishing vessels can remain at sea for up to 3 months and travel at 14-16 knots. Factoryships are also coming into general use.

Discussing new vessels, the Chairman claimed that in 1965 the Soviet fishing fleet would become the world's largest. He said a number of new classes of vessels would come into use in the next few years, most notable of which would be the Vostock-class of factory motherships.

Carrying 14 fishing vessels on board, the Vostock would be able to stay at sea for 125 days, in which time it would produce 10,000 tons of frozen fish, 1,000 tons of fish meal, 10 million cans of fish, and about 100 tons of industrial fats.

The Chairman emphasized that fresh-water fishing was not being ignored in the Soviet Union. The development of inland fishing is an important phase of Soviet planning. At present, he said, rivers and reservoirs were yielding only 20 to 60 pounds of fish per acre, where-

U. S. S. R. (Contd.):

as properly farmed ponds were giving 1,000 to 2,000 pounds per acre.

On the subject of fish farms, he said the development of hydroelectric schemes had considerably hampered the natural spawning habits of sturgeon and salmon, but now, with more than 100 Soviet fish farms in operation, this had been overcome. (*Fishing News*, London, January 29, 1965.)

DEEP-WATER TRAWLING TESTS IN BERING SEA RESULT IN GOOD CATCHES:

In mid-1964, the Soviet news agency Tass reported on deep-water trawling in the Bering Sea by the Soviet exploratory vessel Academician Berg as follows:

"The large refrigerator trawler... is catching halibut and other fish in the Bering Sea at a depth of 1,000 meters (3,280 feet). The purpose of its voyage, scheduled for almost a month, is to study and improve the techniques of catching fish at great depths. Trawling has shown that there are large stocks of valuable fish in these layers of the Bering Sea and that a big catch can be made there. The Academician Berg is making a



The Soviet trawler Zhemchug fishing in the Bering Sea. Its home port is Vladivostok

daily catch of up to 500 metric centners (110,230 pounds) at a depth of 1,000 meters or 3,280 feet). The trawler has of late been evolving methods of fishing at a depth of 1,200 meters (3,936 feet)." The article pointed out that the Academician Berg is a "flag ship of the fish-locating fleet." (*Scottish Fisheries Bulletin*, No. 22, December 1964.)

Note: See *Commercial Fisheries Review*, December 1964 p. 114. October 1964 p. 80.

FISHERY RESEARCH IN PACIFIC OCEAN:

Soviet research expeditions in the Bering Sea, the Gulf of Alaska, the Central Pacific, and the eastern Indian Ocean were organized in 1964 by the Pacific Scientific Research Institute for Fisheries and Oceanography (TINRO), at Vladivostok. Over 20 fishery and oceanographic research vessels were deployed and several hundred scientists participated in the expeditions. A total of 165 scientific papers was published by TINRO scientists. The work of some biologists was considered of such importance that they were proposed as candidates for the Lenin Prize.

In 1965, TINRO will obtain new research vessels and modern electronic instruments to intensify fishery research in the northern, central, and southern Pacific Ocean, as well as in equatorial waters. The emphasis will be on biological studies of saury and tuna, and exploring for commercial quantities of molluscs. Soviet Far Eastern fishing operations are dependent on TINRO's biological studies.

The Soviets plan to catch 1.9 million metric tons of fishery products from their Far Eastern bases in 1965. The 1964 catch from those bases amounted to about 1.8 million tons and 1963 catch was 1.6 million tons. Plans projected for 1970 provide for a Soviet Far Eastern fishery catch of about 3 million tons.

JAPAN LAUNCHES FIRST OF NEW SERIES OF FACTORYSHIPS FOR SOVIETS:

A Japanese shipbuilder announced the launching at Yokohama on January 14, 1965, of the fish factoryship Spassk (19,000 gross tons), the first of 8 such vessels of the same class for V/O Sudoimport in the Soviet Union.

The Spassk has the following specifications: length between perpendiculars 160 meters (525 feet), breadth moulded 24 meters (79 feet), depth moulded 14.8 meters (48.5 feet), main diesel engine 5,500 brake horsepower at 125 r.p.m., cruising speed 14 knots, gross tonnage 19,000 tons, and deadweight tonnage 10,000 tons.

The Spassk will be equipped with modern equipment for fish processing, canning, and refrigeration. Crew and factory workers on the vessel will total 280 persons.

The Spassk has the approximate daily capacity to freeze 100 metric tons of fish, can 50 tons of fish, pack 100 tons of salt herring

U. S. S. R. (Contd.):

in barrels, and process 20 tons of fish meal. Cold-storage capacity is 12,500 cubic meters (441,434 cubic feet), which can be maintained at -30°C . (-22°F .) even in tropical waters. The Spassk's refrigeration plant can also manufacture 48 tons of ice a day.

The Spassk is scheduled to be delivered to the Soviet Union in April 1964, and all eight factoryships of this class are to be delivered by November 1966. (Fisheries Attache, United States Embassy, Tokyo, February 10, 1965.)

Note: See Commercial Fisheries Review, April 1964 p. 74.

FREEZER-TRAWLER "SKAZOCHNIK ANDERSEN" DELIVERED TO SOVIETS BY DANISH SHIPYARD:

The 2,570-ton freezer-trawler M/S Skazochnik Andersen was delivered to Sudoiimport, Moscow, by a Copenhagen shipyard February 10, 1965. The vessel is the 7th in a series of 15 freezer-trawlers for the U.S.S.R. being built by the Danish shipyard to the following specifications: length between perpendiculars 91 meters (298.5 feet), breadth 16 meters (52.5 feet), and deadweight tonnage 2,550 to 2,600 metric tons. The first vessel in the series was the M/S Skryplev launched May 10, 1962.

The M/S Skazochnik Andersen is designed to serve mainly as a refrigerator vessel, but it can also operate as a stern trawler. Speed

on loaded trials was 14 knots. (Regional Fisheries Attache, United States Embassy, Copenhagen, February 17, 1965.)

Note: See Commercial Fisheries Review, Mar. 1965 p. 93; Feb. 1965 p. 80; Oct. 1964 p. 56, May 1964 p. 75; Mar. 1964 p. 70; and Sept. 1962 p. 71.

ANOTHER LARGE STERN FACTORY TRAWLER LAUNCHED:

The 13th Soviet large stern factory trawler built in 1964, the Grigorii Shelekhov, was launched September 30, 1964, at the U.S.S.R. Nosenko Shipyard at Nikolaev on the Black Sea. It confirms previous estimates that the Nikolaev Shipyards are capable of building from 1 to 2 "Maiakovskii" class trawlers a month. It is estimated that 17 or 18 trawlers of that class were built by the end of 1964.

FAR EASTERN PROVINCE OF SAKHALIN EXPANDS FISHERIES:

The Soviet Far Eastern Province of Sakhalin began a major shift to distant-water fisheries in 1959, according to a report published by the Japanese Government. The change followed the launching in 1959 of a new Soviet 7-Year Economic Development Plan. The Plan set a fisheries production goal of 261,000 metric tons by 1965 for Sakhalin Province (which includes Sakhalin Island and the Kuril Islands). To achieve that target, Sakhalin's fishing industry switched from its dependence on the coastal herring



New Soviet freezer-trawler Skazochnik Andersen.

U. S. S. R. (Contd.):

and salmon fisheries to the development of distant-water fisheries. Effort was also directed toward fishing for saury, scallops, and kelp. As a result, Sakhalin's fisheries production rose from 94,000 metric tons in 1958 to 222,000 tons in 1961, 234,000 tons in 1962, 273,000 tons in 1963, and 288,000 tons as of October 1964.

The catch increase was attributed to the extension of large-scale trawling operations to the eastern Bering Sea and the Gulf of Alaska, and the development of a herring purse-seine fishery in the Okhotsk Sea and northern Bering Sea. In 1963, distant-water operations reportedly accounted for 88 percent of Sakhalin Province's total fishery production.

The Japanese report says that the Soviet fishing fleet presently based in Sakhalin Province includes 3 large refrigerated factory-ships, 5 large stern trawlers, 70 medium and large trawlers, and a number of purse seiners. The Japanese report on Sakhalin was compiled by a Japanese Fisheries Agency official who recently completed his third visit to the Soviet maritime provinces. (Suisan Keizai Shimbun, January 19, 1965.)



United Kingdom

CANADIAN FISHERIES FIRM
JOINS BRITISH FROZEN FOOD CONCERN:

In order to build up its supplies of frozen fish, Britain's largest frozen food company has entered into a partnership with one of Newfoundland's largest fish-processing companies. The Newfoundland firm is processing about 35 million pounds of fish a year in five plants on the Avalon Peninsula. The British firm in the new partnership said the deal would help it to meet its future "ambitious targets in a situation of increasing shortage of the types and quality of fish it requires."

Fishery products hit record sales in Britain in 1964 and accounted for about one-third of the British frozen food market. (The Journal of Commerce, February 15, 1965.)

METHOD OF PRESERVING FISH IN
ANTIBIOTIC ICE PATENTED:

The German firm Henkel & Cie has been granted British Patent No. 947,688 for a method of preserving fish by storing in a bactericidal ice produced by freezing a 0.01-percent aqueous solution of peracetic acid. (Food Technology, July 1964.)

MEETING TO BE HELD ON FISHING
VESSEL DESIGN IN RELATION TO
FISH QUALITY IMPROVEMENT:

The British White Fish Authority is sponsoring a meeting in London, May 31-June 1, 1965, on the design of fishing vessels and their equipment in relation to the improvement of fish quality. The meeting will focus on ways to maintain fish quality on vessels at sea. The agenda for the meeting lists the following topics for discussion:

- (1) Design and operation of fishing vessels when the catch is stowed in melting ice. (Fish handling, stowage, and unloading will be discussed as well as fishroom design.)
- (2) Other chilling techniques such as chilled sea water, superchilling, antibiotic ice, and gas stowage.
- (3) Freezer trawlers and their equipment.
- (4) Factory trawlers and motherships.

The meeting on quality and vessel design is scheduled in conjunction with the World Fishing Exhibition to be held May 27-June 2, 1965. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen.)

SALMON AND TROUT
FISH-FARMING PROJECT PLANNED:

A pilot fish-farm project for breeding and rearing salmon and trout is planned at Inverailort, Scotland, by an internationally known British firm. The firm said that the project is only a pilot plan and that development on any major scale will take place only if the venture is successful.

Planning permission, which has been given in principle by the Invernesshire County Planning Committee, covers a hatchery, ponds,

United Kingdom (Contd.):

houses, and a laboratory. The project will require large quantities of salt water daily, as well as a continuous flow of fresh water, electrical power, and feeding and fertilizing materials. Initially about 20 to 45 persons are expected to be employed.

In May and July 1964, the firm completed an arrangement with Norwegian fish-farming interests which gave them world rights in the exploitation of a system of breeding and rearing salmon and trout.

Investment in the project is expected to be high, and a sum of £2 million (US\$5-6 million) has been indicated. Apart from the actual farming process, a successful project would involve investment in packing, processing and refrigeration, storage and distribution, if the project is to be of economic importance to the area where it is located. (*Fishing News*, London, January 29, 1965.)

Note: See *Commercial Fisheries Review*, November 1964 p. 115.



Venezuela

TUNA LANDINGS, 1963:

Venezuela's tuna landings in 1963 amounted to 3,089 metric tons valued at 4.6 million Bolivares (US\$1.5 million). All of the tuna catch is sold domestically as fresh fish. (United States Embassy, Caracas, January 20, 1965.)

* * * * *

SARDINE FISHERY TRENDS
AND EXPORTS, 1963:

Venezuela's commercial marine fish and fresh-water fish landings in 1963 totaled 97,442 metric tons valued at 56.5 million Bolivares (US\$18.3 million), an increase of 2.7 percent in quantity from the previous year. Marine fish landings of 90,320 tons for the year included 34,553 tons of sardines valued at about \$1 million, or nearly 40 percent of the total marine fish landings. Anchovy landings for the year were 593 tons.

The sardine canning industry, centered at Cumana in the eastern part of the country, continues to be the largest part of Venezuela's commercial fishery. The sardine fishery is conducted largely out of that area. Sardines are caught in nets because purse seining is prohibited (to protect the resource), and they

can be caught only during certain months of the year.



Fig. 1 - Unloading sardines from boat at a cannery in Venezuela.

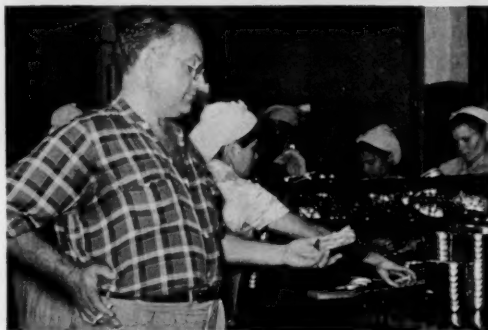


Fig. 2 - Packing precooked sardines in cans at a cannery in Cumana.



Fig. 3 - Sealing machine used in sardine cannery at Cumana.

About 80 percent of Venezuela's sardine pack is consumed by the domestic market. The Venezuelan Fishermen's Union, however,

Venezuela (Contd.):

believes that exports of canned sardines should be increased and that Venezuela should enjoy a greater share of the world export market.



Fig. 4 - Cases of canned sardines ready for shipment at cannery in Cumana.

Venezuela's canned fish exports in 1963 were mostly canned sardines for a total of 2,071 tons with an export value of \$1.1 million. West Germany, Australia, the United States, and Jamaica were among the principal buyers of Venezuelan canned sardines. (United States Embassy, Caracas, January 20, 1965.)

SHRIMP FISHERY TRENDS AND EXPORTS, 1963:

Venezuela's shrimp fishery is divided between the Punto Fijo area and Lago de Maracaibo in the western part of the country. In 1963, shrimp landings totaled 8.6 million

pounds valued at 6.2 million Bolivares (US\$2 million), of which 7.4 million pounds valued at \$2.6 million were exported, practically all of it to the United States. The spiny lobster catch for the year was 273,000 pounds.

The Venezuelan Fishermen's Union has complained that Venezuela's shrimp fishery is completely exploited by foreign interests and that about 13 foreign firms operate in the Maracaibo area, only one of which offers steady employment to Venezuelan workers.

Large-scale shrimp fishing is planned in 1965 in the eastern part of the country. Venezuelan industry sources would like to see a pilot fishing project started in the Gulf of Paria and waters near the Orinoco Delta. But opinion is divided as to the possibilities in that region. Some industry members believe that fishing in that region, particularly for shrimp, should be equal to, or better than, in the Gulf of Mexico. Others believe that there is nothing worth fishing for there.

Experiments were conducted in several places of eastern Venezuela with new production techniques. Wire-mesh enclosures were used with success in the cultivation of shrimp in the lagoon of Puerto Piritu in the eastern part of the country, but apparently that technique has not been applied in other areas. (United States Embassy, Caracas, January 20, 1965.)



Yugoslavia

FISHING VESSELS BUILT FOR TUNISIA:

Ten fishing vessels were built for Tunisia at a shipyard in Pula, Yugoslavia. Four of the vessels were to be delivered in December 1964, another 4 in January, and 2 in February 1965.

They are equipped with 200-hp. diesel engines capable of a speed of 10 knots. The vessels are intended for deep-sea fishing. Each has a 1,589-cubic foot cold-storage area, deep-freezing facilities, radio, echo-sounder, and other modern electrical equipment.

The Yugoslav shipyard delivered 5 vessels of the same type to Tunisia about two years ago. (*Privredni pregled*, Belgrade, November 13, 1964.)

Yugoslavia (Contd.):

One of the three tuna purse seiners being built at the Pula shipyard was recently completed. They are scheduled for delivery to a Yugoslav fishing company in May, July, and September 1965.

Note: See Commercial Fisheries Review, January 1964 p. 96.



Zanzibar

SARDINE VESSELS FROM EAST GERMANY:

Six sardine fishing vessels are scheduled to be delivered to Zanzibar in 1965 by East Germany under a trade protocol signed by the two countries in September 1964. Another 4 vessels are to be delivered in 1966 to be followed by 6 more in 1967. The vessel agreement with East Germany was mentioned in a Zanzibar newspaper on January 23, 1965. (United States Consul, Zanzibar, February 5, 1965.)



FISH EAT WEEDS TO AID POWER PLANT OPERATION

Some 15,000 grass-eating fish are helping to keep the lights burning in England. The fish are young grass carp that thrive on the large crops of weeds growing in the Cavendish Dock, which supplies water to the cooling system of the electric power station at Barrow-in-Furness. The fast-growing weeds had clogged the water inlets and often nearly stopped its flow.

The young fish, about 2 to 2.5 inches long, were flown to England from Hong Kong in 60 water-filled plastic bags packed in an electrically-heated box. Upon arrival in England, the fish were put into a 3,000-gallon tank of fresh water. The water was changed gradually until it became a mixture of fresh and salt water similar to that in the dock.

The grass carp, which will weigh about 70 pounds full grown, are busily eating weeds in the dock to keep the water flowing freely.

The Central Electricity Generating Board in England, which ordered the carp, decided to use the fish as a solution to the weed problem after an experiment. In the test 25 grass carp were taken from the London Zoo and put into the dock. Those fish made gluttons of themselves on the vast amount of food available, said the senior chemist to the board. It was then decided that at least 14 tons of grass carp would be needed to keep the weeds down.

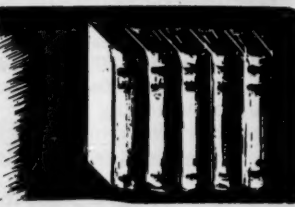
The board still has one problem, however, it does not know whether the fish will breed in England. This may mean that the whole operation will have to be repeated in a few years.

Grass carp are being tested in the United States for their ability to eat aquatic weeds. Nearly 100 of those fish were flown from Malaysia early in 1964 to Stuttgart, Ark. They are a possible solution to the aquatic weed problem in lakes, ponds, streams, and fisheries, the Chief, Division of Fish Research, U. S. Fish and Wildlife Service, points out.

Aquatic weeds interfere with fishing, boating, and raising fish, particularly in many southern states of the United States. (Science News Letter, August 29, 1964.)



FEDERAL ACTIONS



Department of the Interior

EXTENSION OF FISHERY LOAN PROGRAM REQUESTED:

Congress has been asked for legislation aimed at assuring loans for upgrading and modernizing the commercial fishing fleet of the United States, announced the U. S. Department of the Interior, February 1, 1965, thereby contributing to a more efficient and profitable operation. The loan program is administered by the Department's Bureau of Commercial Fisheries.

The U. S. Department of the Interior requested an amendment to the Fish and Wildlife Act of 1956 which would extend until 1975 the authority to make such loans. The fishery loan section of that Act is scheduled to end June 30, 1965.

Proposed legislation would continue to limit loans from an existing \$13 million revolving fund to applicants unable to obtain financial assistance from other sources at reasonable rates. The Department said the loan program has filled this credit gap and enabled fishermen to obtain financing needed to continue operation of their

vessels. The dual impact of foreign competition and increasing United States imports of fishery products has increased the need for reasonable long-term financing for fishing vessels and gear, the Department explained.

In submitting the legislative proposal, the Department said that as of July 31, 1964, a total of 142 fishing vessels had been replaced under the Act and that 588 other vessels had been converted, rebuilt, repaired, or re-equipped with certain fishing gear or with new engines. In addition, 280 vessel mortgages and lienable debts of another 255 vessels were refinanced. Many of these were multipurpose loans.

The proposed legislation also provides that the annual interest rate on each loan shall be at a rate determined by the Secretary of the Treasury to be consistent with rates of interest on other public loans of comparable maturity.

FISH AND WILDLIFE SERVICE

HEARINGS ON APPLICATIONS FOR FISHING VESSEL CONSTRUCTION DIFFERENTIAL SUBSIDY:

The following firms have applied for fishing vessel construction differential subsidies:

Firm and Address	Overall Size	Fisheries	Hearing Notice in Federal Register	Date of Hearing
		 (1965)	
Jacobsen Fishing Co. Fairhaven, Mass.	96.5 ft.	Groundfish, flounder, lobster	Feb. 13	Mar. 16
Hercules Fishing Products, Inc. Fairhaven, Mass.	100 ft.	Scallop, tuna, groundfish, lobster	Feb. 16	Mar. 18
Elmo, Inc. Port Monmouth, N. J.	220 ft.	Menhaden; other herring-like fish	Feb. 20	Mar. 23
Rockaway, Inc. Port Monmouth, N. J.	"	"	"	"
Calcasieu, Inc. Port Monmouth, N. J.	"	"	"	"
Boat Gannet Inc. New Bedford, Mass.	96.5 ft.	Groundfish, flounder, lobster	Feb. 25	Mar. 25
A. Irving Tormala and Edna E. Tormala Fort Myers, Fla.	85 ft.	Shrimp, snapper, grouper, Atlantic tuna	Feb. 25	Mar. 30

Hearings on the economic aspects of the applications were scheduled to be held in Washington, D. C.

Note: See *Commercial Fisheries Review*, Mar. 1965 p. 98, Feb. 1965 p. 91, Jan. 1965 p. 99.



Department of the Treasury

BUREAU OF CUSTOMS

GROUND FISH FILLET IMPORT TARIFF-RATE QUOTA FOR 1965:

The reduced-tariff-rate import quota on fresh and frozen groundfish (cod, haddock, hake, pollock, cusk, and ocean perch) fillets and steaks for calendar year 1965 is 24,383,589 pounds, the Bureau of Customs announced in the February 18, 1965, Federal Register. Divided into quarterly quotas this means that 6,095,897 pounds of groundfish fillets and steaks during each quarter of 1965 may be imported at the 1-7/8 cents-per-pound rate of duty and any imports over the quarterly quota will be dutiable at the rate of 2-1/2 cents a pound.

Reduced Tariff-Rate Import Quota for
Fresh and Frozen Groundfish Fillets, 1954-1965

Year	Quota
	1,000
	Lbs.
1965	24,384
1964	24,862
1963	24,875
1962	28,571
1961	32,601
1960	36,533
1959	36,920
1958	35,892
1957	37,376
1956	35,197
1955	35,433
1954	33,950

The reduced-rate import quota for 1965 is 1.9 percent less than the 1964 quota of 24,861,670 pounds. From 1951 to 1960 the quantity of fresh and frozen groundfish fillets permitted to enter the United States at the reduced rate of duty of 1-7/8 cents a pound had increased 24.7 percent, but in 1961 the trend was reversed significantly for the first time because in 1960 frozen fish fillet blocks with bits and pieces were no longer dutiable under the Tariff category of "frozen groundfish fillets." Further declines took place in 1962 and 1963, and the quota for 1965 is about one-half million pounds less than in 1964.

Average aggregate apparent annual consumption in the United States of fresh and frozen groundfish fillets and steaks (including the fillet blocks and slabs used in the manufacture of fish sticks, but excluding fish blocks since September 15, 1959, and blocks of fish bits) for the three years (1962-64) preceding 1965 was 162,557,262 pounds, calculated in accordance with headnote 1, Part 3A, Schedule 1, under item 110.50, of the Tariff Schedules of the United States. This was far below the consumption of 217,337,633 pounds in 1958-60 and 243,554,480 pounds for 1957-59.

The notice as it appeared in the Federal Register of February 18, 1965, follows:

DEPARTMENT OF THE TREASURY

Bureau of Customs

[T.D. 56360]

CERTAIN FISH

Tariff Rate Quota, 1965

FEBRUARY 12, 1965.

The tariff-rate quota for the calendar year 1965, on certain fish dutiable under item 110.50, Tariff Schedules of the United States.

In accordance with item 110.50 of part 3, schedule 1, Tariff Schedules of the United States, it has been ascertained that the average aggregate apparent annual consumption in the United States of fish, fresh, chilled or frozen, fillets, steaks, and sticks, of cod, cusk, haddock, hake, pollock, and rosefish, in the 3 years preceding 1965, calculated in the manner provided for in headnote 1, part 3A, schedule 1, was 162,557,262 pounds. The quantity of such fish that may be imported for consumption during the calendar year 1965 at the reduced rate of duty under item 110.50 is, therefore, 24,383,589 pounds.

[REAL] LESTER D. JOHNSON,
Acting Commissioner of Customs.

Note: See *Commercial Fisheries Review*, April 1964 p. 78.



White House

NEW ASSISTANT SECRETARY OF THE INTERIOR FOR FISH AND WILDLIFE:

President Johnson announced his intention on February 11, 1965, to nominate Dr. Stanley A. Cain of Ann Arbor, Mich., as Assistant Secretary of the Interior for Fish and Wildlife to replace former Assistant Secretary Frank P. Briggs, who resigned February 28, 1965.

The new Assistant Secretary has had a long and distinguished career in many fields of conservation and science. From 1950 to 1961 he

was Chairman of the University of Michigan's School of Natural Resources, and since 1950 has been the Charles Lathrop Pack Professor of Conservation. He was president of the Ecological Society of America in 1958 and was vice president of the American Association for the Advancement of Science in 1954.



Dr. Stanley A. Cain

Dr. Cain has been a member of the Advisory Board for Wildlife and Game Management in the Department of the Interior since 1962, and has also served on the Department of the Interior Advisory Board on National Parks since 1960, and was named Board Chairman in 1964.

A member of the Advisory Board of the Conservation Foundation since 1954, Dr. Cain also has been Chairman of the Environmental Biology Panel of the National Science Foundation in 1958-59, Chairman of the Michigan Department of Conservation during 1963-64, a trustee of the Cranbrook Institute of Science since 1961, a trustee of the National Parks Association since 1963, and has been a representative of the National Academy of Sciences at various international meetings.

He has contributed to two Department of the Interior reports on wildlife and game management and on predator and rodent control, and has received many national and international honors.

Two books have been written by Dr. Cain, and he also is the author of more than 100 articles on botany, biogeography, and conservation.

Born in Jefferson County, Ind., June 19, 1902, Dr. Cain received his Bachelor of Science Degree from Butler University in 1924, his Master of Science Degree from the University of Chicago in 1927, and his Doctor of Philosophy Degree from that University in 1930. He has taught at Butler University, Indiana University, and the University of Tennessee. (News release, Office of the White House Press Secretary, February 11, 1965.)

ADVISORY COMMITTEE ON EXPANDED TRADE WITH SOVIET BLOC:

On February 18, 1965, the President created a special advisory committee to help him explore ways of increasing peaceful trade with the Soviet Union and Eastern European bloc countries. J. Irwin Miller, a businessman from Columbus, Ind., was named chairman of the new committee. The White House Press Secretary said the group's function will be to "survey the field" and report its findings and recommendations to the President. (Evening Star, Washington, D. C., February 18, 1965.)

Senator Magnuson had previously introduced in the Senate on February 1, 1965, a joint resolution (S. J. Res. 36) to develop proposals for the expansion of trade by the establishment of a high-level advisory council. Senator Magnuson in his remarks (Congressional Record, February 1, 1965, pp. 1711-1712) pointed out that the council could advise Congress and the President of the extent to which, and the methods by which, trade in nonstrategic goods and services between the United States and countries within the Communist bloc can profitably be expanded.



Eighty-Ninth Congress (First Session)



Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ANTIDUMPING ACT AMENDMENT: H. R. 4970 (Philbin) introduced in House Feb. 16, 1965, to amend the Antidumping Act, 1921; to Committee on Ways and Means. Similar to other bills.

AQUATIC PLANT CONTROL: H. R. 5696 (Long of Md.) introduced in House Mar. 2, 1965, to provide for the control and progressive eradication of certain aquatic plants in the States of Maryland, Virginia, New Jersey and Tennessee; to Committee on Public Works.

S. 1380 (Case) introduced in Senate Mar. 4, 1965, to provide for the control of obnoxious aquatic plants in navigable and allied waters; to Committee on Public Works.

FISHERIES LOAN FUND EXTENSION: H. R. 5153 (Rivers of Alaska) introduced in House Feb. 18, 1965,

to extend the term during which the Secretary of the Interior is authorized to make fisheries loans under the Fish and Wildlife Act of 1956, and for other purposes; to Committee on Merchant Marine and Fisheries. Similar to other bills.

FISH HATCHERIES: H. R. 4886 (Perkins) introduced in House Feb. 15, 1965, to provide for the establishment of a fish hatchery in the State of Kentucky; to Committee on Merchant Marine and Fisheries. Similar to other bills.

FOOD MARKETING NATIONAL COMMISSION: Senate received a letter Feb. 24, 1965, from the Chairman, National Commission on Food Marketing, Washington, D. C., transmitting a draft of proposed legislation to extend for 1 year the date on which the National Commission on Food Marketing shall make a final report to the President and to the Congress and to provide necessary authorization of appropriations for such Commission (with accompanying paper); to Committee on Commerce.

H. R. 5702 (Cooley) introduced in House Mar. 2, 1965, to extend for 1 year the date on which the National Commission on Food Marketing shall make a final report to the President and to the Congress and to provide necessary authorization of appropriations for such Commission; to Committee on Agriculture.

FUR SEALS: Sen. Thurmond in his remarks (Congressional Record, Feb. 19, 1965, pp. A725-A726) stated that in the Feb. 1, 1965, issue of *Barron's*, a national business and financial weekly, there was a very interesting and revealing article ("The Vanishing Seal: . . .") concerned with the Government contract to process the furs of the national supply of sealskins.

Sen. Gruening remarked (Congressional Record, Mar. 4, 1965, pp. 4072-4073) on the fur sealskin processing contract. He inserted the full text of Alaska State Senate Resolution 30 and news stories appearing in Feb. 25 and 26, 1965, issues of *Women's Wear Daily* on the Mar. 2 meeting the Alaska congressional delegation had with Secretary of the Interior Udall to discuss the problem of sealskin processing.

GREAT LAKES COMMERCIAL FISHERMEN'S PROBLEMS: Sen. Hart inserted in the Congressional Record, Feb. 11, 1965 (pp. 2571-2572) material made available by the Lake Superior Commercial Fishermen's Association and the Michigan Fish Producers' Association, that documents the reasons why disaster aid is needed by their industry.

HAWAII: House Document H. Doc. 68, Honokahau Harbor, Hawaii (Letter from the Secretary of the Army, transmitting a letter from the Chief of Engineers, Department of the Army, dated July 1, 1964, submitting a report, together with accompanying papers and illustrations, on an interim report on Honokahau Harbor, Hawaii, authorized by the River and Harbor Act approved May 17, 1950), referred to Committee on Public Works, House of Representatives, 89th Congress, 1st Session, Feb. 1, 1965, 78 pp., illus., printed. Besides the favorable report of the District Engineer, it contains comments of various Federal agencies, State of Hawaii, and reports from Chief of Engineers and Board of Engineers for Rivers and Harbors. One section discusses the commercial fishing benefits of the project. It points out that the average annual fish catch for the 6-year period 1956-1961 was about 93,300 pounds valued at \$23,200. An average of about 50 percent increase in

fishing time would increase the average catch to 139,700 pounds valued at \$34,700.

INLAND, GREAT LAKES, AND WESTERN RIVERS RULE FOR SMALL VESSELS: S. 1349 (Magnuson) introduced in Senate Mar. 4, 1965, to amend the inland, Great Lakes, and western rivers rules concerning sailing vessels and vessels under 65 feet in length; to Committee on Commerce. Sen. Magnuson in his remarks (Congressional Record, Mar. 4, 1965, pp. 3990-3991) pointed out that the purpose of the bill is to clarify the duties of small craft when operating in narrow channels in which large vessels are also navigating. The bill would amend the existing inland, Great Lakes, and western rivers rules of the road to provide that, in a narrow channel, a sailing vessel or a steam vessel (any vessel propelled by machinery) under 65 feet in length shall not operate so as to hamper the navigation of larger vessels which can only navigate within the channel.

INTERIOR DEPARTMENT APPROPRIATIONS: The House Subcommittee on Appropriations for the Dept. of the Interior and related agencies held hearings Feb. 9, 1965, on fiscal year 1966 budget estimates of the Office of the Commissioner of Fish and Wildlife and the Bureau of Commercial Fisheries.

Subcommittee of Senate Committee on Appropriations held hearings Feb. 15-19, 1965, on fiscal year 1966 budget estimates for the Department of the Interior and related agencies; received testimony from Secretary of the Interior Udall. On Feb. 17 the State of Washington Senate and Feb. 24, 1965, the House of Representatives laid a resolution before the Senate on the installation of the Willamette Falls fishways under the federally financed Columbia River fishery development program, requesting the restoration of funds for the fishways in the fiscal year 1966 budget of the Interior Department. This was submitted with the concurrence of the Legislature of the State of Oregon. Fishways would improve the economy of the States of Washington and Oregon by increasing the annual production of salmon and steelhead trout by some 320,000 fish, according to the resolution; to Committee on Appropriations. Subcommittee on fiscal 1966 budget estimates for the Department of the Interior and related agencies, of Senate Committee on Appropriations, met Mar. 1-5, 1965. During hearings, Mar. 2, 1965, received testimony from the Commissioner of Fish and Wildlife, Director of Bureau of Commercial Fisheries, and Director of Bureau of Sport Fisheries and Wildlife. Hearings continued.

INTERIOR DEPARTMENT: On Feb. 19, 1965, the Senate Committee on Interior and Insular Affairs received the nomination of Stanley A. Cain, of Michigan, to be Assistant Secretary of the Interior for Fish and Wildlife.

MARINE EXPLORATION AND DEVELOPMENT ACT: H. R. 5884 (Rivers of Alaska) introduced in House Mar. 5, 1965, to provide a program of marine exploration and development of the resources of the Continental Shelf; to Committee on Interior and Insular Affairs.

NATIONAL FISHERY CENTER AND AQUARIUM ADVISORY BOARD: Senate Feb. 23, 1965, announced the Vice President's appointment of Senator Prouty (Vt.) as a member of the National Fisheries Center and Aquarium Advisory Board for a 4-year term.

NATIONAL SCIENCE FOUNDATION: H. Doc. 89, *Fourteenth Annual Report of the National Science Foundation* (Message from the President of the United States

transmitting, The Fourteenth Annual Report of the National Science Foundation for Fiscal Year 1964, pursuant to the National Science Foundation Act of 1950; referred to the Committee on Science and Astronautics, House of Representatives, 89th Congress, 1st Session, Feb. 15, 1965, 159 pp., printed, illus., and accompanying papers. Contains letters of transmittal, Director's Statement, and program activities of the National Science Foundation. One section of the program deals with oceanographic research vessels and facilities.

NORTH PACIFIC FISHERIES TREATY: House Speaker, Feb. 23, 1965, presented a memorial of the Legislature of the State of Washington relative to requesting full consideration of the value of salmon fisheries to Alaska, to the Pacific Northwest, and to the Nation as a whole, and to take appropriate action necessary to preserve this industry; to Committee on Merchant Marine and Fisheries.

The Senate of the State of Washington petitioned the Senate to consider with the greatest care the value of our salmon fisheries to Alaska, to the Pacific Northwest, and to the Nation as a whole, and to take all appropriate action necessary to preserve this industry by insisting upon language in the revised treaty that will furnish adequate protection for it; to Committee on Commerce.

Rep. Pelly in extension of remarks in Congressional Record, Mar. 3, 1965 (pp. A949-A950) inserted the text of a Washington State Senate petition.

Sen. Magnuson inserted in the Congressional Record, Mar. 4, 1965 (pp. 3978-3979) Washington State Senate Resolution No. 1965-24 (adopted Feb. 17). Rep. Meeds inserted the same resolution in the Congressional Record, Mar. 5 (pp. 4139-4140).

OCEANOGRAPHIC AGENCY OR COUNCIL: H. R. 5654 (Fascell) introduced in House Mar. 2, 1965, to provide for expanded research in the oceans and the Great Lakes to establish a National Oceanographic Council, and for other purposes; to Committee on Merchant Marine and Fisheries. Rep. Fascell in his remarks (Congressional Record, Mar. 2, 1965, pp. 3884-3885) pointed out that the Vice President shall be Chairman of the Council and members will include the Secretaries of State, Treasury, Defense, Interior, Commerce, Health, Education, and Welfare, Director of the Office of Science and Technology, Chairman of the Atomic Energy Commission, Director of the National Science Foundation, and the Secretary of the Smithsonian Institution. Purpose is to set forth policy and furnish the guidance, cooperation, and coordination needed to develop ocean research to the fullest extent. It would also help centralize and more readily provide significant and timely information to high officials, including Congress, about these aims and activities.

Senate Committee on Commerce met Feb. 19, 1965, on S. 944, to establish a National Oceanographic Council. Would establish a policy and purpose for national oceanographic program; and provide high-level guidance and coordination of Government activities. Hearings were held and testimony was received from Director, Office of Science and Technology; Assistant Secretary of the Navy for Research and Development; and Chairman, Interagency Committee on Oceanography. Hearings were recessed subject to call.

OCEANOGRAPHY: Rep. Keith in his remarks in Congressional Record, Feb. 25, 1965 (pp. A826-A827)

commented on the special report of the Committee on Oceanography of the National Academy of Sciences--National Research Council, "Economic Benefits From Oceanographic Research": "The committee--NASCO... has made a detailed and thoughtful evaluation of future economic benefits that could result from oceanographic research, and compares these benefits with the cost of doing the research." He inserted an editorial ("Would Do Well"), by the Cape Cod Standard Times, Hyannis, Mass., on the report.

On Mar. 2, the House and on Mar. 4, 1965, the Senate received a communication from the President of the United States, on the national oceanographic program for fiscal year 1966; referred to House Committee on Merchant Marine and Fisheries and Senate Committee on Commerce.

Sen. Magnuson in an extension of remarks (Congressional Record, Mar. 4, 1965, pp. A969-A970) inserted an article ("Oceanography and the National Welfare") written by Rear Adm. Denys W. Knoll, U. S. Navy, from the Dec. 1964 issue of Navy. In the same day's Record (pp. A957-A959) Sen. Magnuson inserted Capt. T. K. Treadwell's (U. S. Navy) article ("The Soviet Effort in Oceanography") from the same issue of Navy.

Rep. Findley (Congressional Record, Mar. 5, 1965, pp. A990-A991) in extension of remarks inserted an article ("Wilson Urges U. S. Agency to Direct Oceanography") from the Pacific Coast Industry & Electronic News, outlining the efforts being made by Congressman Bob Wilson of California in behalf of streamlining and expediting the various aspects of oceanographic research by the Government.

OCEANOGRAPHY LEGAL PROBLEMS: H. R. 5175 (Lennon) introduced in House Feb. 18, 1965, providing for a study (by U. S. Coast Guard) of the legal problems of management, use, and control of the natural resources of the oceans and ocean beds, to Committee on Merchant Marine and Fisheries.

OUTER CONTINENTAL SHELF RESTRICTED AREAS: H. R. 5270 (Aspinall) introduced in House Feb. 23, 1965, to provide for the restriction of certain areas in the Outer Continental Shelf, known as the Corpus Christi Offshore Warning Area, for defense purposes and for other purposes; to Committee on Interior and Insular Affairs.

H. R. 5271 (Aspinall) introduced in House Feb. 23, 1965, to provide for the restriction of a certain area in the Outer Continental Shelf for defense purposes, and for other purposes (Matagorda Water Range); to Committee on Interior and Insular Affairs.

The Public Lands Subcommittee of Senate Committee on Interior and Insular Affairs, Feb. 25, 1965, in executive session approved for full committee consideration certain bills to restrict for defense purposes certain areas in the Outer Continental Shelf: S. 426, the Eastern Test Range; S. 427, the Gulf Test Range; S. 428, the Matagorda Water Range; and S. 645, the Corpus Christi Offshore Warning Area for Navy use for 6 years. Prior to this action testimony was received from various government officials.

PESTICIDES RESEARCH: House received a letter Mar. 5, 1965, from the Assistant Secretary of the Interior, transmitting a draft of proposed legislation entitled "A bill to amend the act of Aug. 1, 1958, relating to a continuing study by the Secretary of the Interior of the effects of insecticides, herbicides, fungicides, and

other pesticides upon fish and wildlife for the purpose of preventing losses to this resource"; to Committee on Merchant Marine and Fisheries. To increase fund authorization.

SCIENCE AND TECHNOLOGY COMMISSION: S. 1136 (McClellan and 4 others) introduced in Senate Feb. 17, 1965, for the establishment of a Commission on Science and Technology; to Committee on Government Operations. Sen. McClellan in his remarks (Congressional Record, Feb. 17, 1965, pp. 2709-2710) pointed out that this bill provides for the establishment of a Hoover-type commission composed of representatives from the legislative and executive branches of the Government and of persons from private life who are eminent in one or more fields of science or engineering, or who are qualified and experienced in policy determination and administration of industrial scientific research and technological activities. Objective is a study of all of the programs, methods, and procedures of the Federal departments and agencies which are operating, conducting, and financing scientific programs to bring about more economy and efficiency. (Similar to bills in 88th Congress, particularly S. 816, passed by Senate Mar. 8, 1963, and referred to House Committee on Science and Astronautics; no further action.)

SMALL BUSINESS DISASTER LOANS: Introduced in House, H. R. 4978 (Teague of Calif.) Feb. 16, 1965, and H. R. 5507 (Don H. Clausen) Feb. 25, 1965, to authorize additional funds to be available exclusively for disaster loans; to Committee on Banking and Currency. Similar to other bills.

SUPPLEMENTAL APPROPRIATIONS FY 1965: H. Doc. 98, Supplemental Estimate of Appropriations for Various Agencies and the District of Columbia; Communication from the President of the United States transmitting a report indicating the necessity for a supplemental estimate of appropriations for fiscal year 1965 for various agencies and the District of Columbia; referred to Committee on Appropriations, House of Representatives, 89th Congress, 1st Session, Mar. 2, 1965, 26 pp., printed. Includes, among others, increased pay costs for the Office of the Commissioner of Fish and Wildlife, Bureau of Commercial Fisheries, and Bureau of Sport Fisheries and Wildlife Service.

SUSQUEHANNA RIVER DAM: H. R. 5423 (Rhodes of Pa.) and H. R. 5430 (Schneebeli) introduced in House and S. 1265 (Clark and Scott) introduced in Senate, Feb. 24, 1965, to authorize the construction of a dam on the Susquehanna River, Pa., to respective Committees on Public Works. Sen. Clark in his remarks (Congressional Record, Feb. 24, 1965, pp. 3392-3393) pointed out that a separate fishway will be provided in order not to interfere with fish runs.

TECHNOLOGICAL LABORATORY LAND IN MARYLAND: H. R. 5788 (Fallon) introduced in House Mar. 3, 1965, to provide for the conveyance of certain real property of the United States to the State of Maryland; to Committee on Interior and Insular Affairs. Property affected includes the site of the Bureau of Commercial Fisheries Technological Laboratory, College Park, Md. (Similar to H. R. 2888 and S. 673, 88th Congress; hearing held on House Bill; no further action.)

TRADE AGREEMENT AUTHORITY: H. R. 5566 (Derwinski) introduced in House Mar. 1, 1965, to amend the Trade Expansion Act of 1962 to provide that the authority to enter into trade agreements under such act will expire at the close of 1965; to Committee on Ways and Means.

TRADE EXPANSION ACT ADJUSTMENT ASSISTANT AMENDMENT: S. 1333 (Hartke) introduced in Senate Mar. 1, 1965, to amend the adjustment assistance provisions of the Trade Expansion Act of 1962 with respect to determinations by the Tariff Commission of injury or threatened injury to firms or groups of workers; to Committee on Finance. Under the amendment, it must be established to the satisfaction of the Tariff Commission that the increased imports are attributable in whole or in part to concessions under trade agreements; also that the increased imports have been the predominant factor in causing, or threatening to cause, serious injury to a firm, or unemployment or underemployment of a group of workers. Changes in the adjustment assistance provisions relate to the standards to be applied by the Tariff Commission in measuring injury to firms and unemployment of workers.

WATER POLLUTION CONTROL ACT: Special Subcommittee of Senate Committee on Public Works on Air and Water Pollution met Feb. 23, 24, and 26, 1965, on S. 560, proposed Federal Installations, Facilities, and Equipment Pollution Control Act.

WATER POLLUTION CONTROL ADMINISTRATION: Introduced in House, H. R. 4953 (Howard) Feb. 16, 1965; H. R. 5036 (Giaino) and H. R. 5071 (Helstoski) Feb. 17; H. R. 5151 (Reuss) and H. R. 5159 (Schmidhauser) Feb. 18; H. R. 5411 (McGrath) Feb. 24, 1965; to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, etc.; to Committee on Public Works. Similar to other bills.

Committee on Public Works held hearing Feb. 18-19, 1965, on H. R. 3988, S. 4, and related bills. Testimony was given by Secretary of the Interior Udall, and Representatives Dingall, Ottinger, McCarthy, and Saylor. Hearing continued Feb. 23.

WATER PROJECT RECREATION ACT: S. 1229 (Jackson) introduced in Senate Feb. 19, 1965, to provide uniform policies with respect to recreation and fish and wildlife benefits and costs of Federal multiple purpose water resource projects, and to provide the Secretary of the Interior with authority for recreation development of projects under his control; to Committee on Interior and Insular Affairs. Also, H. R. 5269 (Aspinall) introduced in House Feb. 23; to Committee on Interior and Insular Affairs; similar to S. 1229 and H. R. 52.

Subcommittee on Irrigation and Reclamation of House Committee on Interior and Insular Affairs, Mar. 5, 1965, considered H. R. 5269. Testimony was given by Assistant Secretary of the Interior and public witnesses. Then full Committee met Mar. 10, 1965, on the bill.

WATER RESOURCES PLANNING ACT: River Basin Planning Act: Hearing before the Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, United States Senate, 89th Congress, 1st Session, on S. 21 (a bill to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a water resources council and river basin commissions, and by providing financial assistance to the states in order to increase state participation in such planning), Feb. 5, 1965, 42 pp., printed. Contents include departmental reports; statements and communications from various Federal officials, Senators, and associations. Appendix contains excerpts from Senate report on S. 1111 (88th Congress).

Senate Committee on Interior and Insular Affairs, Feb. 24, 1965, in executive session, ordered reported favorably with amendments S. 21, proposed Water Resources Planning Act. Same day bill was reported to Senate (S. Rept. 68).

S. Rept. 68, Water Resources Planning Act (Feb. 24, 1965, report from the Committee on Interior and Insular Affairs, U. S. Senate, 89th Congress, 1st Session, to accompany S. 21), 10 pp., printed. Committee reported bill favorably with amendments. Discusses purpose, major provisions of the bill, background, and presents agency reports. Bill is to encourage the wise management, orderly development, and highest possible uses of water and related land resources through coordinated and cooperative efforts by Federal agencies and the State and local governments. Would establish a Water Resources Council; authorize the President to create river basin commissions for coordinated studies and planning within a State, basin, or group of basins; and provide Federal grants to States to assist

them in developing comprehensive water and related land resources plans.

Senate Feb. 25, 1965 passed with committee amendments S. 21 and sent it to the House on Mar. 1, for concurrence. On same day House referred S. 21 to Committee on Interior and Insular Affairs. Sen. Ellender inserted some remarks in Mar. 4 Congressional Record (pp. 4094-4095) on S. 21.

WATER RESOURCES RESEARCH: Irrigation and Reclamation Subcommittee of Senate Committee on Interior and Insular Affairs met Mar. 2, 1965, on S. 22, authorizing additional funds to promote a wider national program of water research. On same date began hearings, and concluded them Mar. 3.

Note: REPORT ON FISHERY ACTIONS IN 88TH CONGRESS: The U. S. Bureau of Commercial Fisheries has issued a leaflet on the status of all legislation of interest to commercial fisheries at the end of the 88th Congress. For copies of MNF-3—"Legislative Actions Affecting Commercial Fisheries, 88th Congress, 1st Session 1963 and 2nd Session 1964," write to the Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 N. Fort Myer Drive, Room 510, Arlington, Va. 22209. Requests for this leaflet will be filled on a first-come first-served basis until the supply is exhausted.



FOOD PRESERVATION BY IRRADIATION OUTLINED IN ARMY'S PETITION TO FOOD AND DRUG ADMINISTRATION

The original petition by the Army's Quartermaster General to the Food and Drug Administration (FDA) for permission to use gamma radiation for food preservation has been released to industry. The petition, approved in 1963 by the FDA, is available from the U.S. Department of Commerce through its Office of Technical Services. It describes the complete irradiating process for canned bacon--the initial food product irradiated by the Cobalt-60 source used by the Army's investigators.

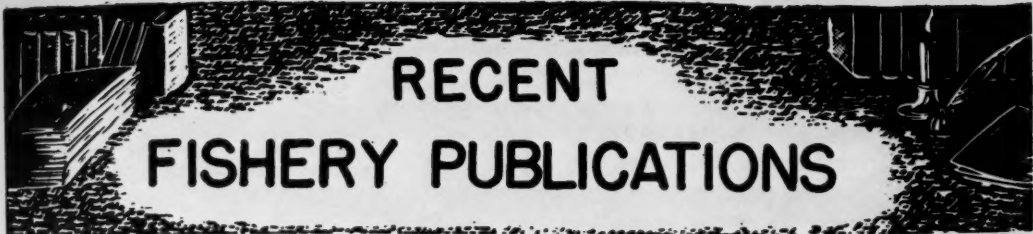
"A milestone in the history of food preservation," says the Quartermaster General, referring to the FDA's approval of the ionizing radiation process. "It culminates a decade of U. S. Army-sponsored research. This is the first approval obtained from a regulating agency of any country for a radiation sterilized food. It opens the way for the development of the first new method of food preservation, except for canning, since the dawn of history."

The process yields a safe irradiated product which remains free from toxic and other micro-biological spoilage. And the precedents established by the Army's petition for the approval of the process with the research data that accompanied it, facilitated the later clearances of other irradiated foods. For example, wheat and wheat products can be disinfested by gamma radiation. White potatoes can be sprout-inhibited. The shelf life of fresh fish can be extended.

"This petition," says the Army, "and the years of research it represents will be instrumental in the future clearance of a broad spectrum of radiation-preserved foods. The removal of legal restrictions for unrestrained consumption of these foods will open up new industries, help raise living standards, and reduce the incidence of food borne disease throughout the world."

You can buy Use of Ionizing Gamma Radiation from a Cobalt-60 Source for Preservation of Bacon for \$3.00. Order publication PB 166 130N from OTS, U. S. Department of Commerce, Washington, D. C. 20230.

Note: See Commercial Fisheries Review, June 1964 p. 24.



RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE
OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHING-
TON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOL-
LOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED
DISTRIBUTION).
WL - WILDLIFE LEAFLET.

- | Number | Title |
|----------|---|
| CFS-3453 | - Canned Fishery Products, 1963 Annual Summary (Revised), 18 pp. |
| CFS-3454 | - Industrial Fishery Products, 1963 Annual Summary (Revised), 9 pp. |
| CFS-3537 | - Fish Meal and Oil, May 1964, 2 pp. |
| CFS-3564 | - Shrimp Landings, March 1964, 5 pp. |
| CFS-3601 | - Hawaii Landings, 1963 Annual Summary, 4 pp. |
| CFS-3616 | - Chesapeake Fisheries, 1963 Annual Summary, 9 pp. |
| CFS-3617 | - Texas Landings, June 1964, 2 pp. |
| CFS-3627 | - Texas Landings, 1963 Annual Summary (Revised), 9 pp. |
| CFS-3679 | - Gulf Fisheries, 1963 Annual Summary, 16 pp. |
| CFS-3681 | - Gulf Coast Shrimp Data, August 1964, 20 pp. |
| CFS-3683 | - North Carolina Landings, October 1964, 4 pp. |
| CFS-3684 | - New Jersey Landings, October 1964, 3 pp. |
| CFS-3691 | - Alaska Fisheries, 1963 Annual Summary, 8 pp. |
| CFS-3692 | - Michigan, Ohio & Wisconsin Landings, September 1964, 4 pp. |
| CFS-3695 | - Mississippi Landings, August 1964, 3 pp. |
| CFS-3696 | - Maryland Landings, October 1964, 4 pp. |
| CFS-3697 | - Fish Meal and Oil, October 1964, 2 pp. |
| CFS-3698 | - Shrimp Landings, September 1964, 5 pp. |
| CFS-3699 | - Gulf Coast Shrimp Data, September 1964, 20 pp. |
| CFS-3700 | - North Carolina Landings, November 1964, 4 pp. |
| CFS-3701 | - New York Landings, October 1964, 5 pp. |
| CFS-3702 | - Rhode Island Landings, August 1964, 3 pp. |
| CFS-3703 | - Shrimp Landings, October 1964, 5 pp. |
| CFS-3705 | - Louisiana Landings, October 1964, 3 pp. |
| CFS-3706 | - Alabama Landings, October 1964, 3 pp. |
| CFS-3707 | - Virginia Landings, October 1964, 4 pp. |
| CFS-3708 | - Maine Landings, October 1964, 4 pp. |

- CFS-3709 - Florida Landings, November 1964, 8 pp.
CFS-3711 - Mississippi Landings, September 1964, 3 pp.
CFS-3713 - California Landings, August 1964, 4 pp.
CFS-3716 - Rhode Island Landings, September 1964, 3 pp.

Sep. No. 728 - Review of the Development of the Atlantic Coast Tuna Fishery.

Sep. No. 729 - How Tuna See A Net.

FL-522 - Separates from the Commercial Fisheries Review, 9 pp., revised July 1964. Contains a list of available reprints of articles from Commercial Fisheries Review, listed alphabetically by subject.

FL-588 - Index of Publications by the Branch of Technology, Bureau of Commercial Fisheries, 1955-59, Inclusive, by F. Bruce Sanford and Helen E. Plastino, 28 pp., 1964.

SSR-Fish, No. 483 - Intertidal Ecology and Life History of Pink Salmon at Olsen Creek, Prince William Sound, Alaska, by John H. Helle, Richard S. Williamson, and Jack E. Bailey, 28 pp., illus., Sept. 1964.

SSR-Fish, No. 486 - Salmon Tagging Experiments Along the South Shore of Unimak Island and the Southwestern Shore of the Alaska Peninsula, by Fredrik V. Thorsteinson and Theodore R. Merrell, Jr., 17 pp., illus., Oct. 1964.

SSR-Fish, No. 487 - Distribution and Seasonal Occurrence of *Gymnodinium breve* on the West Coast of Florida, 1954-57, by John H. Finucane, 17 pp., illus., Sept. 1964.

SSR-Fish, No. 490 - A Remote Controlled Underwater Photographic Surveillance System, by Paul J. Kruse, Jr., 18 pp., illus., Sept. 1964. Describes an underwater motion picture camera system which has been developed and used to study midwater trawling operations. The photographic equipment is handled by remote control from the vessel deck and records both trawl mechanics and fish escape reactions. The equipment has been tested and placed in operation in studies in the Gulf of Mexico.

SSR-Fish, No. 492 - Releases and Recoveries of Drift Bottles and Cards in the Central Pacific, by Richard A. Barkley, Bernard M. Ito, and Robert P. Brown, 33 pp., illus., 1964.

WL-460 - Fur Catch in the United States, 1963, 4 pp., 1964.

Annual Report of the Bureau of Commercial Fisheries Biological Laboratory, Beaufort, N. C., for the Fiscal Year Ending June 30, 1962, Circular 184, 42 pp., illus., September 1964. Presents information on research programs conducted by the laboratory including blue crab, menhaden, shad, Atlantic Coast striped bass, and radiobiological studies.

Annual Report of the Bureau of Commercial Fisheries Biological Laboratory, Beaufort, N. C., for the Fiscal Year Ending June 30, 1963, Circular 198, 26 pp., illus., Nov. 1964. Contains accounts of the work accomplished during FY 1963, including the Director's report covering research highlights, and participation in the Atlantic States Marine Fisheries Commission, training programs, and work conferences; the blue crab program in North Carolina and Florida; the menhaden program covering sampling and population studies and marking methods; the shad program with details on population dynamics and fishway studies; and the Atlantic Coast striped bass program in Albemarle Sound and Chesapeake Bay. Also included are summaries of library activities, seminars presented, meetings attended, and publications by staff members.

Commercial Fisheries of the United States, Conservation Note 2, 8 pp., illus., processed, revised Aug. 1964. Primarily for use as a teaching aid in schools, this leaflet describes briefly the biological and economic classification of fish and shellfish; what man must know--the fishery conservationist's work in learning the maximum sustainable yield for each species and predicting abundance, and in advising the fishing industry how to make the best possible catch without damage to the resource, how to get high-quality fishery products to the family table at a reasonable price, and how to make the best use of fish for industrial purposes. Also discusses the work of the U. S. Bureau of Commercial Fisheries in getting the needed facts--on life histories of various fish species, habitat, the food chain, tagging of fish, color marking, electronic fish finders and other apparatus, gear studies, exploratory fishing, preserving fishery products, developing new products, maintaining quality, and marketing fishery products; other information on marine mammals, international and interstate commissions, and the American catch, and gear and vessels required to land the catch. Two series of sketches depict the gear used to catch finfish and that used to land shellfish.

Reservoir Fishery Research Strategy and Tactics, by Robert M. Jenkins, Circular 196, 15 pp., illus., July 1964.

THE FOLLOWING REPRINTS FROM FISHERY BULLETIN, VOL. 63, NO. 2, 1964, ARE AVAILABLE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240.

A Benthic Community in the Sheepscot River Estuary, Maine, by Robert W. Hanks, pp. 343-353, illus., printed.

Dentition of the Northern Fur Seal, by Victor B. Schefter and Bertram S. Kraus, pp. 293-342, illus., printed.

An Experimental Evaluation of the C¹⁴ Method for Measuring Phytoplankton Production, Using Cultures of DUNALIELLA PRIMOLECTA Butcher, by William H. Thomas, pp. 273-292, illus., printed.

A Morphometric Study of Yellowfin Tuna THUNNUS ALBACARES (Bonnaterre), by William F. Royce, pp. 395-443, illus., printed.

Origins of High Seas Sockeye Salmon, by Fred C. Cleaver, pp. 445-476, illus., printed.

Preconstruction Study of the Fisheries of the Estuarine Areas Traversed by the Mississippi River-Gulf Outlet Project, by George A. Rounsefell, pp. 373-393, illus., printed.

Relation between Spawning-Stock Size and Year-Class Size for the Pacific Sardine SARDINOPS CAERULEA (Girard), by John S. MacGregor, pp. 477-491, illus., printed.

Sexual Maturation and Spawning of Atlantic Menhaden, by Joseph R. Higham and William R. Nicholson, pp. 255-271, illus., printed.

Upwelling in the Costa Rica Dome, by Klaus Wyrtek, pp. 355-372, illus., printed.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL-32	Venezuelan Commercial Catch, Foreign Trade, and Major Developments, 1963, 16 pp.
MNL-94	Malta's Fishing Industry, 1964, 12 pp.
	Checklist of Reports Issued by Fishery Market News Service, February 1965, 6 pp.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE FROM THE TECHNOLOGICAL LABORATORY, U. S. BUREAU OF COMMERCIAL FISHERIES, GLOUCESTER, MASS. 01930.

A Rapid New Electronic Process for Determining the Freshness of Salt-Water Fish, by Chr. Hennings, 17 pp., processed. (Translated from the German, *Zeitschrift für Lebensmittel-Untersuchung und-Forschung*, vol. 119, no. 6, 1963, pp. 461-477.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE FROM THE BIOLOGICAL LABORATORY, U. S. BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII, 96812.

On the Structure of Yellowfin Tuna Schools as Seen from the Distribution of the Catch on the Tuna Longline, by Nobuo Hiramaya, 3 pp., processed. (Translated from the Japanese, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 23, no. 7, 1957, pp. 373-375.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ON LOAN ONLY FROM THE BIOLOGICAL LABORATORY, U. S. BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII, 96812.

A Population Study on the So-Called Makajiki (Striped Marlin) of Both Northern and Southern Hemispheres of the Pacific. II--Fishing Conditions in the Southern Hemisphere, by Misao Honma and Tadao Kamimura, 10 pp., processed. (Translated from the Japanese, *Report of the Nankai Regional Fisheries Research Laboratory*, no. 8, March 1958, pp. 12-21.)

THE FOLLOWING TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE FROM THE TRANSLATION PROGRAM, U. S. BUREAU OF COMMERCIAL FISHERIES, 2725 MONTLAKE BLVD. E., SEATTLE, WASH. 98102.

"Data on salmon predation. 1--On predation on salmon by fur seals," article, *Data on Salmon Predation*, 5 pp., processed. (Translated from the Japanese, *North Pacific Mothership Association, Japan*, 1959.)

"Morphological differences between summer and autumn chum salmon *Oncorhynchus keta* (Walbaum), *O. keta*

(Walbaum) *infrasppecies autumnalis* Berg." by L. D. Grigo, article, Pacific Salmon: Selected Articles from Soviet Periodicals, pp. 13-17, processed. (Translated from the Russian, Doklady Akademii Nauk SSSR, vol. 92, no. 6, 1953, pp. 1225-1228.)

Present Status of Soviet Russian Far Eastern Fisheries and Japanese-Soviet Fishery Negotiations, by Nobuhiko Hanamura, Translation Series No. 23, 4 pp., processed. (Translated from the Japanese, Suisan Kagaku, vol. 6, nos. 3-4, 1957, pp. 25-28.)

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ON LOAN ONLY FROM THE TRANSLATION PROGRAM, U. S. BUREAU OF COMMERCIAL FISHERIES, 2725 MONTLAKE BLVD. E., SEATTLE, WASH. 98102.

The Contemporary State of Active Marine Fisheries in Kamchatka, by V. S. Gorelik, 21 pp., processed. (Translated from the Russian, Vladivostok, Izvestiya Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii, vol. 44, 1957, pp. 223-243.)

Studies on the Albacore. V--The Fishing Condition and Size of Albacore Taken in the South Pacific, by Misao Honma and Tadao Kamimura, 7 pp., processed. (Translated from the Japanese, Report of Nankai Regional Fisheries Research Laboratory, no. 6, March 1957, pp. 84-90.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE FROM THE BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, 101 SEASIDE AVE., TERMINAL ISLAND, CALIF. 90731.

III--Japanese Thinking Vis-a-Vis United States Yellowfin Tuna Regulations, Translation Series No. 12, 6 pp., processed, Feb. 1965. (Translated from the Japanese, Background of the U. S. Regulatory Act for Yellowfin Tuna, 1962, pp. 36-41.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, Dec. 1964, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, Dec. 1964, 18 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; prices for fish meal, oil, and solubles; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, Dec. 1964 and Jan. 1965, 8 and 13 pp. respectively, illus. (U. S. Bureau of Commercial Fisheries, Tuna Resources Laboratory, P. O. Box 271, La Jolla, Calif. 92038.) Con-

tains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the months indicated. The January issue contains an article, "Shark tagging in the eastern Pacific," by Susumu Kato.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, Nov. and Dec. 1964, 14 pp. each. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 704, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Fishery and Oceanography Translations, no. 3, Dec. 1964, 36 pp., processed. (Translation Program, Branch of Reports, U. S. Bureau of Commercial Fisheries, 2725 Montlake Blvd. E., Seattle, Wash. 98102.)

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, Dec. 1964, 11 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

Hydrographic Observations of Tampa Bay, Florida, and Adjacent Waters, August 1961 through December 1962, by Carl H. Saloman, John H. Finucane, and John A. Kelly, Jr. Data Report No. 4, 6 microfiche cards, Jan. 1965. (Branch of Reports, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington, D. C. 20240.)

To Keep Fish Fresh, Circular No. C-190, 12 pp., illus., printed, Aug. 1964. (Technological Laboratory, U. S. Bureau of Commercial Fisheries, Gloucester, Mass. 01930.) Outlines briefly, with the use of drawings and photos, the Laboratory's principal research work--preservation and engineering, protein investigations, information services, irradiation preservation, radiation pasteurization, flavor and odor studies, specifications development, and standards development. The title states the ultimate goal of the work--to keep fish fresh.

New England Fisheries--Monthly Summary, Dec. 1964, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--Oct. 1964, 20 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) **Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, Jan. 1965**, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; shrimp landings; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

"A review of advances in the study of diseases of fish: 1954-64," by George Post, article, *The Progressive Fish-Culturist*, vol. 27, no. 1, Jan. 1965, pp. 3-12, processed, single copy 25 cents.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ABALONE:

"Studies on the nutrition of abalone. I--Feeding trials of abalone, *Haliotis discus* Reeve, with artificial diets," by Chinkichi Ogino and Eisuke Ohta, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 29, July 1963, pp. 691-694, printed, Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

ALGAE:

How to Control Algae (Water Bloom-Pond Scum), Fisheries Leaflet No. 3, 3 pp., printed, 1960. Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

"Key to the genera of the larger green and brown algae around Sydney," by Margaret M. Mackay, article, *Proceedings, Linnean Society of New South Wales*, vol. 88, no. 3, 1964, pp. 361-383, printed, Linnean Society of New South Wales, Science House, 157 Gloucester St., Sydney, Australia.

ANCHOVY:

"Anchoveta--¿aplacara el hambre?" (Anchovy--will it appease hunger?), article, *Mundo Pesquero*, vol. 2, no. 15, Nov. 1964, pp. 11-13, illus., printed in Spanish, single copy \$/. 6.00 (about 25 U. S. cents). Mundo Pesquero, Av. Oscar R. Benavides 1207 (Colonial), Lima, Peru.

ANESTHETICS:

"Anesthetic effect of 4-Styrylpyridine on lamprey and fish," by John H. Howell and Paul M. Thomas, article, *Transactions of the American Fisheries Society*, vol. 93, no. 2, 1964, pp. 206-208, printed, American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

AQUATIC WEEDS:

How to Control Emergent, Marginal, and Floating Aquatic Weeds, Fisheries Leaflet No. 1, 3 pp., printed, 1960. Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

The following abstracts of articles are from *Weed Abstracts*, vol. 12, 1963, printed, British Weed Control Council, 58 Mark Lane, London, England.

These are from no. 6:

"Aquatic weed control and research in the West," by F. L. Timmons, Abstract No. 1663.

"Control of Eurasian water milfoil (*M. spicatum*) in TVA reservoir," by G. E. Smith, Abstract No. 1669.

"Mass treatment with 2, 4-D of milfoil in tidal creeks in Virginia," by D. Haven, Abstract No. 1668.

"Progress report on distribution and control of Eurasian water milfoil in the Chesapeake Bay region, 1962," by J. H. Steenis and V. D. Stotts, Abstract No. 1667.

"Results of 3 years of testing Diquat as an aquatic herbicide in Florida," by R. D. Blackburn and L. W. Welton, Abstract No. 1675.

This from no. 5:

"Aquatic weed control," by E. C. Hughes, Abstract No. 1314.

ARGENTINA:

"La pesca en Republica Argentina" (The fishery in the Republic of Argentina), by E. Postel, article, *La Pêche Maritime*, vol. 44, no. 1042, Jan. 1965, pp. 16-19, illus., printed in French, single copy 14 F (about US\$2.85). La Pêche Maritime, 190, Blvd. Haussmann, Paris 8^e, France.

AUSTRALIA:

Manufacturing Industries, 1962-63, No. 23--Meat and Fish Preserving, by K. M. Archer, 9 pp., processed, Dec. 14, 1964. Commonwealth Bureau of Census and Statistics, Canberra, A. C. T., Australia.

BALTIC SEA:

Changes in the Stocks of Commercial Fishes in the Baltic Sea under the Influence of Oceanographic Factors, by T. F. Dement'eva, OTS 64-21853, 10 pp., processed, 1964. (Translated from the Russian, *Okeanologiya*, vol. 3, no. 5, 1963, pp. 876-885.) Office

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

BIOCHEMISTRY:

Biosynthesis of Trimethylammonium Compounds in Aquatic Animals. IV--Precursors of Trimethylamine Oxide and Betaine in Marine Teleosts, by E. Bilinski, 7 pp., printed. (Reprinted from *Journal of the Fisheries Research Board of Canada*, vol. 21, no. 4, 1964, pp. 765-771.) Technological Laboratory, Fisheries Research Board of Canada, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

CALIFORNIA:

Forty-Eighth Biennial Report, July 1, 1962-June 30, 1964, 40 pp., illus., printed. Conservation Education Division, California Department of Fish and Game, 1416 9th St., Sacramento, Calif. Discusses activities of the Department of Fish and Game, 1962-1964, including, among others, work with inland fisheries, salmon and steelhead, marine resources, law enforcement, and pollution and pesticides. Also covered are how the Department of Fish and Game works, water projects, delta study, fish and wildlife planning, and conservation education.

Freshwater Nongame Fishes of California, by J. Bruce Kimsey and Leonard O. Fisk, 54 pp., illus., printed, 1964. Department of Fish and Game, 722 Capitol Mall, Sacramento, Calif. 95814.

CANADA:

"The fisheries of Quebec," article, *Trade News*, vol. 17, no. 5, Nov. 1964, pp. 6-8, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. During the past 20 years, fishermen in Quebec have landed between 100-150 million pounds of fish a year. Depending on fluctuations in the landed price of fish, the value of the annual catches varied between C\$2 million to \$5 million. Catches of salt-water fish in 1962 reached 130.9 million pounds, while the fresh-water catches amounted to 2.5 million pounds. Cod accounts for more than 60 percent of the landings. Fishing gear consist of hand lines, cod traps, trawl lines with hooks, and other trawls.

The following all processed in French and English and available from Queen's Printer and Controller of Stationery, Ottawa, Canada:

Fisheries Statistics, Alberta and Northwest Territories, 1963, Catalogue No. 24-212, 12 pp., Dec. 1964, C\$0.50. Contains tables giving the value of fishery products by species in Alberta, 1956-63; quantity and value of fish landings, 1962-63; and quantity landed by species with landed and marketed value, by lakes. Also presents tables showing value of fishery products by species Northwest Territories, 1956-63; quantity and value of landings, 1962-63; quantity and value of fishery products; capital equipment employed in primary operations; and number of persons engaged in the fisheries.

Fisheries Statistics of Canada, 1962 (Canada Summary), Catalogue No. 24-201, 59 pp., Dec. 1964, C\$0.75. This report provides a summary of the Canadian fisheries, arranged to show separately the three main fisheries--Atlantic, Pacific, and Inland. Contains statistical tables on quantity and value of land-

ings by species and provinces; value of exports and imports of fish and fishery products; number of vessels engaged in fishing; employment in the primary industry; Canadian lobster pack; British Columbia salmon pack; and fishing bounties paid to vessels. Also includes tables showing sea fish, including molluscs and crustaceans, landed in Nova Scotia, New Brunswick, and Prince Edward Island in 1962, classified by ICNAF division and fisheries districts.

Fisheries Statistics, Manitoba, 1963, Catalogue No. 24-210, 10 pp., Dec. 1964, C\$0.50. Contains tables giving the value of fish landed in Manitoba, 1956-1963; quantity and value of landings by species and fisheries districts, 1962-63; quantity and value of fishery products by species; capital equipment used in the primary fishery operations; and the number of persons engaged in the fisheries.

Fisheries Statistics, Prince Edward Island, 1963, Catalogue No. 24-203, 24 pp., illus., Jan. 1965, C\$0.50. Consists of statistical tables giving the quantity and value of landings, 1951-63; quantity and value of landings and processed products, 1962 and 1963; classification of fishing vessels by tonnage, type of gear used, length, and fisheries districts; new capital investment in the commercial fishery; number of fishermen by extent of employment; and persons engaged in the major fisheries.

Situation Économique de la Pêche Côtière du Québec (Economic Position of Quebec's Coastal Fishery), by Marcel Daneau, 182 pp., printed in French, 1964. Division of Fisheries, Ministry of Industry and Commerce, Quebec, Canada.

CANNING:

"Os corpos gordos na industria de conservas" (The oily substances in the canning industry), by G. Roskis, article, *Conservas de Peixe*, vol. 19, no. 224, Nov. 1964, pp. 15-19, 21, printed in Portuguese. Sociedade da Revista Conservas de Peixe, Lda., Regueirao dos Anjos, 68, Lisbon, Portugal.

CARP:

Carp Facts, by Leo Rock, Fish Mgt. Mimeo No. 17, 2 pp., processed, Aug. 1962. Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

Selected Articles, by Jan Marian Wlodek, OTS 63-11403, 32 pp., printed, 1964, 50 cents. (Translated from the Polish, *Acta Hydrobiologica*, vol. 1, no. 1, 1959, pp. 5-16, 17-36.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230. Contains "Morphological characteristics of carp from Golysz pond farm," and "Studies on the body structure of Polish carp."

CHILE:

"Chile--atún y anchovetas" (Chile--tuna and anchovies), article, *Pesca y Marina*, vol. 16, no. 6, Dec. 1964-Jan. 1965, pp. 6-7, illus., printed in Spanish. Fernando Flores Limitada, 705 N. Windsor Blvd., Los Angeles 38, Calif.

COASTAL WETLANDS:

Broad Marsh, by Robert F. Hutton, 6 pp., illus., printed. (Reprinted from *Massachusetts Audubon*, Winter 1964, pp. 65-70.) Division of Marine Fisheries, Mas-

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sachusetts Department of Natural Resources, 15 Ashburton Pl., Boston 8, Mass. In a historic decision of March 9, 1964, a Massachusetts Judge ruled that "Broad Marsh is a 'salt marsh' necessary to preserve and protect marine fisheries." Whatever the outcome of appeal, the decision stands as the first legal recognition of a biological fact: that salt marshes are related to the prosperity of marine fisheries. Some states have been trying to protect their wetlands and estuaries from destruction through educational and planning programs both at the state and local levels. Other states have introduced legislation directed toward that protection. In Massachusetts on May 22, 1963, Chapter 426 was passed by the Legislature of the Commonwealth and took effect immediately. This Act requires proper notification to local and state licensing agencies by petitioners seeking license to alter shoreline areas; the holding of a local hearing on each such proposed project; the evaluation of possible detriment to marine fishery resources and the imposing of appropriate conditions upon such projects by the Director of Marine Fisheries to protect adequately the fishery resources.

COBIA:

Spawning of the Cobia, RACHYCENTRON CANADUM, in the Chesapeake Bay Area, with Observations of Juvenile Specimens, by Edwin B. Joseph, John J. Norcross, and William H. Massmann, Contribution No. 157, 5 pp., illus., printed, (Reprinted from Chesapeake Science, vol. 5, no. 1-2, March-June 1964, pp. 67-71.) Virginia Institute of Marine Science, Gloucester Point, Va.

COD:

Research Concerning Cod in the Southern Part of Bornholm Basin in 1951-1952 (Badania nad Dorszem Północnym Części Basenu Bornholmskiego w Latach 1951-1952), by Czesław Zukowski, OTS 61-11366, 35 pp., illus., processed, 1964, 50 cents. (Translated from the Polish, Prace Morskiego Instytutu Rybackiego w Gdyni, vol. 9, 1957, pp. 45-78.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

"Variation in abundance of polar cod of the Pomor coast of the White Sea," by A. M. Anukhina, article, Problemy Ispol'zovaniya Promyslovyykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii, vol. 1, 1963, pp. 112-119, printed in Russian. Problemy Ispol'zovaniya Promyslovyykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii, Akademia Nauk SSSR, Moscow, U.S.S.R.

COMMISSIONS:

(Atlantic States Marine Fisheries Commission) Minutes of the 23rd Annual Meeting (September 22-24, 1964, Atlantic City, N. J.), 189 pp., illus., processed, limited distribution. Atlantic States Marine Fisheries Commission, 336 E. College Ave., Tallahassee, Fla. 32301. Covers minutes of the 23rd annual meeting of the Commission with details of attendance; the first, second, third, and fourth general sessions; and section meetings of the North Atlantic, Middle Atlantic, Chesapeake Bay, and South Atlantic Sections. Also includes accounts of the individual section meetings, resolutions recommended for adoption, and the executive committee and biological

committee meetings. Appendices contain, among others, reports on water pollution and commercial fisheries, Commercial Fisheries Research and Development Act of 1964, current problems and trends in the sanitary production of shellfish, fishery legislation of the 88th Congress, extent and effects of foreign fishing off the Atlantic Coast, menhaden investigations, and estuaries--the forgotten natural resource. Also contained in the appendices are reports on coastal alterations, technological research needs, hard clam size limits in various states and possibilities of a uniform size limit, and summer flounder research and recommendations for additional study.

COMPOSITION:

"Determination of sodium and potassium in fish and other marine products," by Mary H. Thompson, article, Journal of the Association of Official Agricultural Chemists, vol. 47, August 1964, pp. 701-707, printed, Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington, D. C. 10004.

CONSERVATION:

Federal Aid in Fish and Wildlife Restoration (Annual Report on Dingell-Johnson and Pittman-Robertson Programs for the Fiscal Year Ending June 30, 1963), 82 pp., processed, 1964. Sport Fishing Institute, Bond Bldg., Washington, D. C. 20005. Presents a short program review of expenditures and projects operated during FY 1963, and statistical tables giving data on individual projects, land purchases, hunting and fishing licenses issued by the states, and other pertinent information.

CRABS:

Meat Content of King Crabs (PARALITHODES CAMTSCHATICA, Tilesius) from Kodiak Island, Alaska, by Guy C. Powell and Richard B. Nickerson, Informational Leaflet 46, 12 pp., processed, Jan. 10, 1965. Department of Fish and Game, Support Bldg., Juneau, Alaska. To study periodic variation in meat content, 5 to 10 king crabs of similar length were selected each month from Oct. 16, 1961, to June 27, 1962, omitting only March and May. The total cooked meat of the three pairs of walking legs was extracted. The merus meat of the right middle walking leg was found to be a satisfactory index of total leg meat weight because of the high meat content and relative uniformity throughout the molt cycle. In another study, conducted during March 1960, the total cooked meat of the chelae, walking legs, body, and abdomen was removed from six juvenile king crabs and 16 adults of varying shell ages. The percentage of meat yield from juvenile crabs was less than that for adults. Newly molted crabs yielded a lower percentage of meat than crabs with 11-month old shells. The authors concluded that total commercial yield can be increased by harvesting crabs during seasons when meat content is high. They recommended that methods for determining meat yield be standardized.

CRUSTACEA:

Deoxyribonucleic Acids of Crustacea, by Michael Smith, 7 pp., illus., printed, (Reprinted from Journal of Molecular Biology, vol. 9, 1964, pp. 17-23.) Technological Research Laboratory, Fisheries Research Board of Canada, 6640 NW Marine Dr., Vancouver 8, B. C., Canada.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

DIRECTORIES:

Conservation Directory, 1964-65--A Listing of Organizations, Agencies and Officials Concerned with Natural Resource Use and Management, 110 pp., processed, Sept. 1, 1964, \$1. National Wildlife Federation, 1412 16th St. NW., Washington, D. C. 20036. Includes names and addresses, together with other pertinent information, of United States Government agencies; independent U. S. Government agencies; international, national, and interstate commissions; international organizations; national organizations; regional organizations; colleges and universities; agencies and organizations in states and territories; Canadian Government agencies; Canadian national citizens' groups; and Canadian provincial and territorial agencies and citizens' groups.

World Fishing Guide, 1964 Edition, 189 pp., illus., printed in German, Spanish, and English, £3 (about US\$8.40). Grampian Press Ltd., The Tower, 229-243 Shepherds Bush Rd., Hammersmith, London W6, England. The Guide is compiled to fulfill the need for a comprehensive directory of companies manufacturing gear, equipment, and supplies for the fishing industry. The manufacturers' directory is compiled under product headings. Under each heading, the name and address of companies manufacturing these items are given in full, by country. Companies in 21 countries are listed. A products index in the front of the book is provided, with reference numbers to the sections concerned. The fishing vessel builders' directory is devoted to listing shipyards in 17 countries engaged in vessel construction. Slipway and berth capacities together with the types of vessels built are specified and, where possible, names of designers are also given. A new section lists the fishing vessels completed in Europe and Canada in 1963, with details of propulsion machinery, fish detection and navigational equipment, and other features.

DRUM:

The Freshwater Drum, by Arnold Fritz, Fish Mgt. Memo No. 26, 2 pp., processed, Nov. 1963, Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

The Pelagic Eggs and Early Larval Stages of the Black Drum from Chesapeake Bay, by Edwin B. Joseph, William H. Massmann, and John J. Norcross, Contribution No. 156, 10 pp., illus., printed. (Reprinted from Copeia, no. 2, June 30, 1964, pp. 425-434.) Virginia Institute of Marine Science, Gloucester Point, Va.

EAST GERMANY:

Fischerei-Forschung, vol. 2, no. 1, 1964, 138 pp., illus., printed in German. Institut für Hochseefischerei und Fischverarbeitung, Rostock-Marienehe, Democratic Republic of Germany. Includes, among others, articles on: "Erster bericht über kabeljau-markierungen 1961/62 bei Westgrönland" (The first report on 1961/62 cod tagging period in the area of western Greenland), by E. Biester; "Der einsatz von echographen in der fischereiforschung der kusten-fischerei" (The use of echographs in coastal fishery research), by K. Falk and W. Bobzin; "Ergebnisse von stromungstechnischen untersuchungen an netztuchern im windkanal" (The results of technical investigations on the trawl mesh resistance to current in a wind tunnel), by H. Stengel and H. J. Fischer; "Ergebnisse von stromungstechnischen untersuchun-

genanschleppnetzmodellen im windkanal" (The results of technical investigations on resistance of trawl models in a wind tunnel), by H. Stengel and H. J. Fischer; "Ein messgerät zur Bestimmung der netzöffnungshöhe--eine entwicklung vom Institut für Hochseefischerei und Fischverarbeitung" (An apparatus for the determination of the height of net opening--a new development worked out by the Institut für Hochseefischerei und Fischverarbeitung), by H. Seiler; "Neue wege bei der gestaltung von booten für die kusten-fischerei" (New ways of building boats engaged in coastal fisheries), by H. Glanz; "Untersuchungen über den einfluss der standzeiten von 'fischkonserven' vor der sterilisation auf die qualität des endproduktes" (Research on the effects of pre-sterilization storage time on the quality of the end product), by G. Teschke; and "Untersuchungen über gefrierverfahren und schutz-massnahmen zur verlängerung der lagerfähigkeit von tiefgefrorenen spratten und heringen" (Research on the procedures used in freezing and the measures adopted to prolong storage life of deep-frozen sprats and herring), by W. Gutschow.

ECHO-SONDER:

Echo Sounding Through Ice, by T. Hashimoto and others, Paper Presented at Second World Fishing Gear Congress, London, May 25-31, 1963, 6 pp., printed, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla.

EXPLOSIVES:

The Effect of Blasting on the Fish Population in Stagnant and Running Water, by J. Gennerich, Translation No. 610, 18 pp., printed. (Translated from the German, Zeitschrift für Fischerei, vol. 30, 1932, pp. 261-278.) Marine Laboratory, Department of Agriculture and Fisheries for Scotland, P. O. Box 101, Victoria Rd., Torry, Aberdeen, Scotland.

FILMS:

Films about the Canning Industry, 55 pp., illus., printed, fifth edition Dec. 1964. Information Division, National Canners Association, 1133 20th St. NW., Washington, D. C. 20036. Lists alphabetically by titles, with short descriptions and addresses of sources, films about the food and related industries. Includes, among films on many other foods, these on fishery products: "Fish Cookery with Savoir", "It's the Maine Sardine"; "Salmon--Catch to Can"; "Shrimp Tips from New Orleans"; "Fresh Out of the Water"; "Chicken of the Sea" Tuna--from Catch to Can"; "Maine Sardines--the Food and the Industry"; "Sardines from Maine--Down-East Style"; "Shrimp Please"; and "Take a Can of Salmon."

FINLAND:

Foreign Trade Regulations of Finland, by Harold McNitt, OBR 64-132, 8 pp., printed, Dec. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Finland's commercial policy aims at a steady increase in the level of its international trade. In addition to trade policy, the report discusses the import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import controls,

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Finland's export controls, United States foreign trade controls, and Government representation between the two countries.

FISH BARRIERS:

"Erfahrungen mit elektro-fischabweisern" (Experiments with electrical fish barriers), by H. W. Hat-top, article, *Deutsche Fischerei-Zeitung*, vol. 11, no. 11, Nov. 1964, pp. 321-328, illus., printed in German. Neumann Verlag, Dr. Schmincke Alle 19, Radebeul 1, Berlin, Germany.

FISH BEHAVIOR:

"Dynamics of conditioned imitating reflexes in certain sea fishes (cod, coalfish, haddock)," by V. V. Gerasimov, article, *Translation of Doklady Biologicheskikh Nauk SSSR*, vol. 146, nos. 1-6, 1962, pp. 1106-1109, printed. (Translated from the Russian, *Doklady Akademii Nauk SSSR*, vol. 146, no. 6, 1962, pp. 1456-1459.) Consultant's Bureau Enterprises, Inc., 227 W. 17th St., New York, N. Y. 10011.

"Izuchenie povedeniya ryb v zone deistviya orudii lova" (Fish behavior in the zone of action of fishing gear), by N. E. Aslanova, article, *Trudy Vsesoiuznykh Nauchno-Issledovatel'skikh Institut Morskogo Rybnogo Khoziaistva i Okeanografii*, vol. 36, 1958, pp. 33-51, printed in Russian. *Trudy Vsesoiuznykh Nauchno-Issledovatel'skikh Institut Morskogo Rybnogo Khoziaistva i Okeanografii*, Verkhn. Krasnosel'skaia U1, No. 17, Moscow, U.S.S.R.

FISH COOKERY:

The Cookbook of the United Nations, compiled by Barbara Kraus, 146 pp., illus., printed, Oct. 24, 1964. United Nations Association of the United States of America, Inc., New York, N. Y. 10011. Contains 250 authentic recipes, professionally tested by home economists, from 112 countries. In addition to recipes for family meal dishes, there are large-scale buffet menus and recipes for receptions and other group meals. Fish dishes include baked fillets of whiting from Australia, baked fish a la Moscow from the U.S.S.R., Nigerian seafood and black-eyed peas, Belgian fillets of sole Ostendaise, fish soufflé from Iceland, fish stew with vegetables from Upper Volta, Malaysian shrimp with green pepper, New Zealand oyster stew, and many others.

FISHERY MANAGEMENT:

Fish Management Demonstrations, by Al Lopinot, Fish Mgt. Mimeo No. 15, 3 pp., processed, Aug. 1964. Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

FISH FEEDING:

Availability of Food Animals to Some Fishes at Different Conditions of Illumination, by I. I. Girsá, Translation No. 717, 5 pp., printed. (Translated from the Russian, *Akademiya Nauk SSSR*, *Trudy Soveshchaniy Ikhtologicheskoi Komissii*, no. 13, 1961, pp. 355-359.) Marine Laboratory, Department of Agriculture and Fisheries for Scotland, P. O. Box 101, Victoria Rd., Torry, Aberdeen, Scotland.

FISH FINDER:

Comparison between Survey Map by 14.5 kc. fish-finder and that by 200 kc. fish-finder with sharp beam

on same sea, by Tomiju Hashimoto and Yoshinobu Maniwa, OTS 60-13257, 7 pp., processed, \$1.10. (Translated from the Japanese, Technical Report of Fishing Boat, no. 12, 1958, pp. 149-155.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

"Gidroakusticheskiy metod opredeleniya kolichestva ryb v razrezhenom skoplennii" (Hydroacoustic method of determining the quantity of fish at low population density), by O. N. Kiselev, M. D. Truskanov, and M. N. Shcherbino, article, *Referativnyi Zhurnal-Biologiya*, vol. 13, 1962, Abstract No. 13119, printed in Russian. *Akademiya Nauk SSSR*, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

FISHING WITH LIGHTS:

"Daylight lamps for fishing saury," by A. Kovalev, article, *Rybnaya Promyshlennost Dal'nego Vostoka*, no. 1, 1963, p. 27, printed in Russian. *Rybnaya Promyshlennost Dal'nego Vostoka*, Vladivostok, U.S.S.R.

FISH-LIVER OIL:

The following articles from *Chemical Abstracts*, vol. 59, printed; American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006:

"Purification of fish liver oil," by Hiroshi Sone, Oct. 14, 1963, Abstract No. 8550b.

"The vitamin A potency of fish liver oil and its effect on the growth of albino rat. I--Growth tests on various diets," by H. Baba, Sept. 30, 1963, Abstract No. 7915c.

FISH MEAL:

"Nociones basicas acerca de la elaboracion de la harina de pescado" (Basic ideas about the manufacture of fish meal), by Trygve Sparre, article, *Industria Conservera*, vol. 30, no. 304, Oct. 1964, pp. 270-272, printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

FISH PUMP:

"Experimental use of fish pumps in various phases of fisheries," by Shin'ichi Yajima and others, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 29, September 1963, pp. 834-840, printed in Japanese. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba Kaigandori 6, Minato-ku, Tokyo, Japan.

FISH SAUSAGE:

"Fish sausage and ham industry in Japan," by Eiichi Tanikawa, article, *Advances in Food Research*, vol. 12, 1963, pp. 367-424, illus., printed. Academic Press, 111 Fifth Ave., New York, N. Y. 10003.

FISH SCALES:

"A technique for preparing scale smears," by G. Power, article, *Transactions of the American Fisheries Society*, vol. 93, no. 2, 1964, pp. 201-202, printed. American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

FISH SOUNDS:

Noise of Creatures in Sea in Region of Ultrasound, by Tomiju Hashimoto and Yoshinobu Maniwa, OTS 60-19855, 16 pp., processed, \$1.60. (Translated from the

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Japanese, Technical Report of Fishing Boat, no. 12, 1958, pp. 99-114.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

FISH SPOTTING:

Acoustic sounding for Fish from a Helicopter, by A. P. Golenchenko, 59-19172, 2 pp., microfilm, \$1.80. (Translated from the Russian, *Priroda*, vol. 47, no. 4, 1958, pp. 79-80.) Photoduplication Service, Library of Congress, Washington, D. C. 20540.

"La detección de peces con helicópteros" (Fish spotting with helicopters), by M. Yves Bourdreault, article, *Pesca y Marina*, vol. 16, no. 6, Dec. 1964-Jan. 1965, pp. 8-10, printed in Spanish. Fernando Flores Limitada, 705 N. Windsor Blvd., Los Angeles 38, Calif.

"La localización de bancos de pesca con avión y sonar" (The location of fish schools with airplane and sonar), by Ragnar Hallre, article, *Iberica*, vol. 42, no. 29, Nov. 1964, p. 371, illus., printed in Spanish, single copy 18 ptas. (about 30 U. S. cents). *Iberica*, Palau, 3, Apartado 759, Barcelona-2, Spain.

FISH STOCKS:

Effect of Benthonic Fauna and Zooplankton on Fish Supplies, USSR, TT 64-41086, 22 pp., illus., processed, Aug. 10, 1964, \$1. (Translated from the Russian, *Zoologicheskii Zhurnal*, vol. 53, no. 6, 1964.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

"Oceanological conditions determining the size of the year classes of the most important commercial fishes in the northwestern North Atlantic," by A. A. Elizarov, article, *Okeanologiya*, vol. 3, no. 6, 1963, pp. 1065-1078, printed in Russian. *Okeanologiya*, Akademia Nauk SSSR, Moscow, U.S.S.R.

FLORIDA:

Preliminary Exploratory Fishing on the Florida West Coast, by James E. Tyler, Special Scientific Report No. 8, 18 pp., illus., processed, Nov. 1, 1964. Marine Laboratory, Florida State Board of Conservation, Maritime Base, Bayboro Harbor, St. Petersburg, Fla.

FLounder:

Structure of Catches of Flounder (*PLEURONECTES FLESUS* L.) in the Region of Gdansk in 1945-1952 (Sklad Polowow Storni--*Pleuronectes flesus* L.--Rejonu Gdanskiego w Latach 1945-1952), by Zbigniew Reimann, OTS 61-11364, 54 pp., illus., processed, 1964. (Translated from the Polish, *Prace Morskiego Instytutu Rybackiego w Gdyni*, no. 9, 1957, pp. 103-150.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

FOOD AND AGRICULTURE ORGANIZATION:

From Food and Agriculture Organization, Viale delle Terme di Caracalla, Rome, Italy:

FAO Commodity Review, 1964, 287 pp., printed, 1964. This is one in a series of annual commodity reviews and is divided into three parts. Part I contains a summary of developments in international commodity markets during 1963 and early 1964 and of inter-

national agreements and commodity consultations. Part II is a brief account of the United Nations Conference on Trade and Development, Geneva, March-June 1964. Part III analyses the current situation and outlook for all major agricultural, fishery, and forest products. In 1963, although no spectacular increases were recorded in catches of the leading fishery nations, world fish production probably set a new record of nearly 50 million tons.

Provisional Report of the Forty-Third Session of the Council, 91 pp., processed, Oct. 28, 1964. Presents an account of proceedings and discussions of the 43rd session of the Council of the Food and Agriculture Organization (FAO) held at Rome, Oct. 5-16, 1964. Topics covered include the world food and agriculture situation, activities of the FAO, world food program, constitutional and legal questions, administrative and financial questions, appointments, and other matters such as applications for membership. Included among many other detailed reports were those on activities of the FAO Fisheries Division, the role of FAO in world fishery development, and a plan for rational development of tuna resources in the Atlantic Ocean. "Many delegates considered that the status of the (Fisheries) Division within the Organization should be elevated and some suggested that this might take the form of giving it the status of a department," states one section.

Available from Columbia University Press, International Documents Service, 2960 Broadway, New York, N. Y. 10027:

General Fisheries Council for the Mediterranean, Proceedings and Technical Papers, No. 7, 508 pp., illus., printed, 1964, \$10. Part I contains a list of the participants and a summary record of the plenary sessions of the seventh session of the GFCM, Madrid, March 12-18, 1963. Included is a report of the work programs and recommendations and resolutions of the marine resources, production, utilization, inland waters, and economics and statistics committees. Part II consists of the texts of the technical papers presented in addition to lists of the papers in numerical order and in alphabetical order of authors.

Report of the Twelfth Session of the Conference, 16 November-5 December 1963, 209 pp., printed, 1964, \$3. Included are specific sections dealing with the fishery activities of the organization.

The State of Food and Agriculture, 1964, CL 43/4, 248 pp., illus., printed, 1964, \$6. Included is a section on fishery production.

FOREIGN TRADE:

"10th general revision of export regulations," *Federal Register*, vol. 30, no. 25, Feb. 6, 1965, part II, section 1, pp. 1402-1509; section 2, pp. 1512-1716, printed. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. 20230. Primary purpose of the 10th revision of Subchapter B--Export Regulations, Title 15--Commerce and Foreign Trade, is to consolidate into a new Commodity Control List the export controls which are applicable to all commodities to all destinations. Section I covers mutual assistance on U. S. imports and exports (as applied to selected U. S. imports); scope of export control by Department of Commerce; general

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licenses; provisions for individual and other validated licenses; licensing policies and related special provisions; project license; blanket license (BLT); periodic requirements license (PRL); and time limit license (TL). It also contains information on export clearance and destination control; amendments, extensions, transfers; enforcement provisions; denial of export privileges; administrative reviews and appeals; general orders; exportation of technical data; and priority ratings. Section 2 covers the commodity control list, commodity interpretations, and licensing division jurisdiction over processing codes. Fish and fish preparations are among the commodities covered in this section.

"Worldwide import rules," article, International Commerce, vol. 71, no. 4, Jan. 25, 1965, pp. 8-10, printed, single copy 35 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) License and exchange-permit requirements as of Jan. 1, 1965, of about 119 countries are summarized for United States exporters in this article. Many countries which require import licenses for commercial shipments permit unlicensed imports of commercial samples and advertising matter of no monetary value. However, a number of countries require no import license or exchange permit at all for importation of commodities.

FRANCE:

Foreign Trade Regulations of France, by William Nagel, OBR 64-136, 11 pp., printed, Dec. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) France's trade policy in recent years has been directed toward expansion of exports, liberalization of imports, and simplification of foreign exchange controls. The report explains France's import tariff system, sales and other internal taxes, shipping documents, labeling and marking requirements, and special customs provisions. Also covers non-tariff import controls, France's export controls, United States foreign trade controls, and Government representation between the two countries.

"La producción pesquera francesa ascendió a 507,000 toneladas en 1963" (French fishery production rose to 507,000 metric tons in 1963), article, Boletín de Información, no. 72, September 1964, pp. 19-21, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6ª Planta, Madrid, Spain.

The following articles are from La Pêche Maritime, printed in French; La Pêche Maritime, 190, Blvd. Haussmann, Paris 8^e, France:

Vol. 43, no. 1041, Dec. 1964 (single copy 22.5 F or about US\$4.55):

"La pêche Française a l'heure communautaire" (The French fishery in the Common Market), by Huguette Rozes, pp. 871-875, illus. Discusses the current position of the French fisheries under the European Common Market, imports and exports of fishery products, elimination of duties and quantitative im-

port restrictions among the member countries, and economic and political impact on the fisheries.

"Quelques raisons d'espérer" (Some reasons to hope), by E. Derouin, pp. 876-878, illus. Discusses a number of reasons for expecting improvement in the French fisheries during 1965.

Vol. 44, no. 1042 (single copy 14 F or about US\$2.85):

"Coup d'oeil sur l'évolution de la pêche en 1964" (A look at fishery developments in 1964), by L. Plouas, pp. 7, 8.

FREEZE-DRYING:

The following reports are available free from the Division of Information, OMS, U. S. Department of Agriculture, Washington, D. C. 20250.:

The Awakening Freeze-Drying Industry, by Kermit Bird, 13 pp., illus., processed, Jan. 1965. Discusses the present status of the industry; future aspects of freeze-drying, based on products being developed or market-tested such as coffee, tea, fruits, shrimp and crab, and ice cream; comparison of freeze-drying's growth with several new frozen products; whether freeze-drying will hurt the freezing industry; and a summary of growth prospects. Included are statistical tables showing United States and Canadian firms freeze-drying food for commercial market, January 1965; growth of commercial frozen foods, 1939-62; a graph showing anticipated growth of the freeze-drying industry, 1962-70; and other data.

Freeze-Drying Attitudes (Contains the 1964 Directory of Freeze-Drying), by Kermit Bird, 20 pp., processed, Nov. 1964. Covers the background of freeze-drying of foods during World War II and in Europe; markets for freeze-dried foods such as the armed forces, institutions, and the export trade; how misinformed attitudes toward these products limit their growth; and the need for exchange of information on this process. Included is a directory of freeze-dried food processors, handlers, equipment manufacturers, equipment firms, consultants, and others in North America, Europe, and the rest of the world.

FREEZERSHIP:

Modern Freezing and Refrigerating Installations for Fishing Vessels, by E. Hofman, GB/17/1540, 1 p., printed. (Translated from the German, Hansa, vol. 99, no. 18, 1962, p. 1869.) Association of Special Libraries and Information Bureau, 3 Belgrave Sq., London SW1, England.

FREEZING:

Freezing Meats, Poultry, Eggs, Dairy Products and Fish, by Jewel Graham, HE 60, 12 pp., illus., printed, May 1964. Cooperative Extension Service, Iowa State University, Ames, Iowa. Presents information on advantages of freezing; how to use a freezer most efficiently; how much, what kind, when to buy, and how long to store foods; and how to select and freeze meat, lard, poultry, and dairy products. A section on freezing fish covers cutting, handling of lean and fatty fish, wrapping, glazing, handling of shellfish, and cooking frozen fish. Emphasis is placed on the importance of freezing and maintaining the storage temperature of foods at 0° F.

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FRESH-WATER FISH:

The Affinities and Derivation of the New Zealand Fresh-Water Fish Fauna, by R. M. McDowall, 9 pp., illus., printed. (Reprinted from *Tuatara*, vol. 12, no. 2, July 1964, pp. 59-67.) Fisheries Laboratory, Marine Department, Wellington, New Zealand.

Familiar Fresh-Water Fish (Picture-Story Study Print Set), by R. E. Eshmeyer, set SP 116, 8 color prints, 1964, sold only in sets at \$8 a set (\$7 a set when 6 or more sets are ordered at one time). Society for Visual Education, Inc., 1345 Diversey Parkway, Chicago, Ill. 60614. This set contains eight 13 x 18 inch full-color photo prints of 11 fresh-water fish--yellow perch, northern pike, brown bullhead, largemouth bass, brook trout, carp, common shiner, bluegill, rock bass, pumpkinseed, and black crappie (the last four on one print). On the back of each print is information on the species pictured, together with a diagram showing parts of a fish, general facts about fish, and lists of filmstrips and other study print sets available from the publisher. Each set consists of eight photos, printed on heavy stock and coated with a protective finish; complete lesson material appears on the reverse of each print. They are especially suitable for display, as die-punched holes at the corners permit thumbtack posting without damage to the print. A durable "picture window" display-storage portfolio is provided with each set at no additional charge.

FROZEN FISH:

"Frozen fish, Britain," by H. G. Garland, article, *Foreign Trade*, vol. 123, no. 3, Feb. 6, 1965, pp. 27-28, printed, single copy 25 Canadian cents. Queen's Printer, Government Printing Bureau, Ottawa, Canada. Nearly three-fourths of the fish consumed in Great Britain is sold fresh, but retail packs of frozen fish are now taking an increasing share of the market. Sales of frozen fish products accounted for about one-third of the £75 million (about US\$210 million) spent on frozen foods during 1964 and have increased faster than the sales of other products in the industry. Imports from many countries help to make up the wide variety of packs that stock frozen-food cabinets. Fish sticks are by far the largest selling item but there is a greater choice of brands and sizes of cod, haddock, and plaice fillets. Several brands of kippers, still the breakfast standby in many British households, are sold buttered and boned, and some are available in the "boil-in-the-bag" pack. Competition is keen and is likely to be intensified by a recent merger of three leading companies in the frozen-food industry, one of which is particularly strong in fish products.

"Protein denaturation in frozen fish. VIII--The temperature of maximum denaturation in cod," by R. M. Love and M. K. Elerian, article, *Journal of the Science of Food and Agriculture*, vol. 15, no. 11, Nov. 1964, pp. 805-809, illus., printed, single copy £1 17s. 6d. (about US\$5.30). Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

The Thawing of Blocks of Small Fish, by S. I. Gakichov and V. D. Borodin, OTS 62-13735, printed, \$2.60. (Translated from the Russian, *Gostorgizdat*, Moscow, U.S.S.R., 1959.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

GERMAN FEDERAL REPUBLIC:

Informationen für die Fischwirtschaft, vol. 11, no. 5, 1964, 49 pp., illus., processed in German. Bundesforschungsanstalt für Fischerei, Palmallee 9, Hamburg-Altona 1, Federal Republic of Germany. Includes, among others, these articles: "Tagung der Int. Group for Pelagic Fishing Methods (IF) in Hamburg am 19 u. 20 Okt. 1964" (Meeting of the Group for Pelagic Fishing Methods in Hamburg, 19-20 Oct. 1964); "Forschungsreise des FFS Anton Dohrn in die Norwegischen Gewässer, zur Bäreninsel und zur Skolpenbank vom 12.10-9.11.1964" (Research cruise of the RV Anton Dohrn in Norwegian waters between Oct. 12-Nov. 9, 1964), by H. H. Reinsch; "Forschungsreise mit FFS Walther Herwig, 21.9 bis 14.10.1964, SW-Nordsee, Skagerrak, Ostkante" (Research cruise with RV Walther Herwig, Sept. 21 through Oct. 14, 1964, southwest North Sea, Skagerrak, Ostkante), by J. Scharfe and H. Mohr; "Versuche über 'seelachs in öl'-konservierung" (Experiments on sea salmon in oil preservation), by F. Gehring; "Qualitätsvorschriften für tiefgefrorene Produkte in Frankreich" (Quality norms for deep-frozen products in France), by H. Brockstedt; and "D.L.G. - Leistungsprüfung für tiefgefrorene fische und fischerzeugnisse" (Tests for deep-frozen fish and fishery products), by N. Anton-acopoulos.

Jahresbericht über die Deutsche Fischwirtschaft, 1963/64 (Annual Report on the German Fisheries, 1963/64), issued by the Federal Ministry of Food, Agriculture and Forestry in cooperation with the Federal Statistical Office, 296 pp., illus., printed in German with English table of contents and chapter summaries, Oct. 1964. (Available from Verlag Gebr. Mann, Hauptstrasse 26, Berlin 62, Germany.) A review covering all phases of the German fisheries in 1963/64. Part I contains information on fishery policy, legislation, the sea and coastal fisheries as well as the fish supply, the German fishing fleet, biological-statistical report on the German deep-sea fishery, and foreign trade in fishery products. Part II includes information on cruises of the fishery protection and fishery research vessels, the fishing industry and the Social Security Board for Seamen, work of the German Scientific Commission for the Exploration of the Sea, and fishery research. Part III presents data on the cutter deep sea and coastal fisheries, fresh-water fisheries, the fish meal and oil industry, and the market for salt-water fishery products in the Federal Republic of Germany. Part IV gives data on foreign fisheries.

GREAT LAKES:

"Collection and analysis of commercial fishery statistics in the Great Lakes," by Ralph Hile, article, *Great Lakes Fishery Commission Technical Report*, No. 5, 1962, pp. 1-31, printed. Great Lakes Fishery Commission, Natural Resources Bldg., University of Michigan, Ann Arbor, Mich.

HADDOCK:

Yearly Fluctuations in the Food of Haddock off the Murman Coast (k Voprosu o Ezhegodnykh Kolebaniyakh Pitaniya Fikshi Murmanskogo Poberezh'ya), by R. Ya. Tseeb, OTS 63-11124, 17 pp., illus., processed, 1964, 50 cents. (Translated from the Russian, *Trudy Murmanskogo Morskogo Biologicheskogo Instituta Akademii Nauk SSSR*, no. 2 (6), 1960, pp. 186-202.) Office

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

HERRING:

Clupeidae (Sel'devye), by Anatolii N. Svetovidov, 432 pp., illus., printed, 1963. (Translated from the Russian.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

"Fishery for the Pribilof winter herring," article, Rybnaya Promyshlennost Dal'nego Vostoka, no. 1, 1963, pp. 14-15, printed in Russian. Rybnaya Promyshlennost Dal'nego Vostoka, Vladivostok, U.S.S.R.

Growth of the Otoliths of Young Herring, by G. Hempel, Translation 613, 18 pp., printed. (Translated from the German, Helgolander Wissenschaftliche Meeresuntersuchungen, vol. 6, pt. 3, 1959, pp. 241-258.) Marine Laboratory, Department of Agriculture and Fisheries for Scotland, P. O. Box 101, Victoria Rd., Torry, Aberdeen, Scotland.

"Review and emendation of: Family Clupeidae," by Samuel F. Hildebrand, article, Fishes of the Western North Atlantic, Memoir I, Part 3, pp. 257-454, illus., printed, Mar. 1, 1964, \$27.50. Sears Foundation for Marine Research, New Haven, Conn.

"Storsildundersøkelsene i Nord-Norge 1964" (Investigation of the large herring in Northern Norway in 1964), by Finn Devold, article, Fiskets Gang, vol. 50, no. 51, Dec. 17, 1964, pp. 754-757, illus., printed in Norwegian with English summary. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

The following articles are from Problemy Ispol'zovaniya Promyslovnykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii, vol. 1, 1963, Akademiia Nauk SSSR, Moscow, U.S.S.R.

"Annual variations in the conditions and effectiveness of spawning and their influence on the size of the year classes of the White Sea herring," by K. A. Altukhov, pp. 57-68.

"Distribution of the herring of the White Sea," by Yu. E. Lapin and others, pp. 75-80.

"Morphological-ecological peculiarities in the development of the White Sea herring (Clupea harengus Pallas natio maris-albi Berg)," by S. G. Soin, pp. 68-74.

"Seasonal variations in the food of the White Sea herring," by R. Ya. Margulis, pp. 104-107.

"Similarities and differences in the biological tribes of herring in Onega Bay of the White Sea," by V. M. Erastova, pp. 81-86.

"Similarities in the variations of abundance of the spring-spawning herrings of Northwestern Europe, the Baltic, Atlanto-Scandian, and White Sea herrings," by I. I. Nikolaev, pp. 87-97.

"State of the natural resources and the prospects for 1962 herring fishing in the northwestern part of the White Sea," by B. M. Tambovtsev, pp. 53-56.

"Zooplankton of the White Sea and its importance as food for the herring," by L. M. Epshtein, pp. 98-104.

ICELAND:

"Icelandic fishing vessels. Part One," by Hjalmar K. Bardarson, article, Iceland Review, vol. 2, no. 4, 1964, pp. 29, 31-33, 35-36, illus., printed, single copy Kr. 50 (about US\$1.15). Iceland Review, P.O.B. 1238, Reykjavik, Iceland. As of Jan. 1, 1964, Iceland's fishing fleet of 859 vessels amounted to 75,171 gross registered tons, or more than half the total of 145,000 tons for all vessels. When the vikings first came to Iceland in the 9th century, they brought with them their vessels and the skills necessary to build and operate them. Today, oak plank fishing vessels of up to 200 tons are still being constructed in Iceland. Most vessels constructed in Icelandic yards are of wood. All those vessels are built in accordance with the Icelandic regulations. However, during the last 10 years the number of steel fishing vessels has been increasing very rapidly as compared with the wooden ones. The first steel vessels registered in Iceland were steam trawlers bought from England in 1905. Fewer deep-sea trawlers have been constructed recently for Icelandic owners in recent years. Final rules have not yet been drawn up for the construction of steel vessels. The brisk building program of combination vessels of between 100-300 tons is due mainly to the development in Iceland of new herring fishing techniques, using the hydraulic power block from a special crane above the boatdeck on which the net is placed, together with the increasing use of ascid equipment for locating submerged herring shoals.

ILLINOIS:

Fish Management Program of the Illinois Department of Conservation, by Al Lopinot, Fish Mgt. Mimeo No. 14, 2 pp., processed, Oct. 1961, Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

INDIAN OCEAN:

Brief Review of the Activities of the Second Indian Ocean Expedition of the Azov-Black Sea Fisheries Scientific Institute, by B. S. Solov'ev, OIS 64-21652, 3 pp., processed, 1964. (Translated from the Russian, Okeanologiya, vol. 3, no. 5, 1963, pp. 936-938.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Studies of the Indian Ocean during the 35th Cruise of R/V "Vityaz," by P. L. Bezrukov, JPRS 23281, 10 pp., processed. (Translated from the Russian, Okeanologiya, vol. 3, no. 3, 1963, pp. 540-549.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

INDUSTRIAL PRODUCTS:

"Cuando habla el ingenio" (When the talented person speaks), article, Mundo Pesquero, vol. 2, no. 15, Nov. 1964, pp. 16-17, illus., printed in Spanish, single copy S/. 6.00 (about 25 U. S. cents). Mundo Pesquero, Av. Oscar R. Benavides 1207 (Colonial), Lima, Peru. Discusses how technologists can recommend methods and procedures in the fish meal and oil industry for reducing costs of production and improving product quality.

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INTERNATIONAL COMMISSIONS:

Available from International Commission for the Northwest Atlantic Fisheries, Bedford Institute of Oceanography, Dartmouth, N. S., Canada:

International Commission for the Northwest Atlantic Fisheries, Annual Proceedings for the Year 1963-64, vol. 14, 43 pp., printed, 1964. Presents an account of the activities of the Commission's Secretariat during the year ending June 30, 1964, including financial statements; a report of the Fourteenth Annual Meeting held June 1-6, 1964, in Hamburg, Federal Republic of Germany; and summaries of research in the Northwest Atlantic during 1963 by subareas, including work carried out by member countries, hydrography and plankton reports, stocks of cod, ocean perch, and other fish, and commercial fishing.

International Commission for the Northwest Atlantic Fisheries, Redbook 1964. Part II--Research Reports by Member Countries; Part III--Selected Papers from the 1964 Annual Meeting, 150 pp., illus., processed, Nov. 1964, limited distribution. Part II contains reports on research in the ICNAF area in 1963 by Canadian, Danish, German, Icelandic, Norwegian, Polish, Portuguese, Spanish, United Kingdom, U.S.S.R., and United States groups. The report by each country group discusses the subareas commonly fished by its vessels; and presents information on the status of the fisheries and, frequently, on environmental and biological studies. Part III includes papers on: "The selectivity of a flap-type topside chafer," by R. J. H. Beverton; "Review of tagging publicity methods used by ICNAF member countries," by S. A. Horsted; and "Minimum mesh sizes and equivalents for different materials to meet ICNAF regulations," by F. D. McCracken.

International Commission for the Northwest Atlantic Fisheries, Research Bulletin, No. 1, 1964, 111 pp., illus., printed. This issue is the first of a new annual series intended to provide a means of publishing regularly the results of individual research relevant to the International Commission for the Northwest Atlantic Fisheries. Included are articles on: "Landings, fishing effort, and apparent abundance in the yellowtail flounder fishery," by Fred E. Lux; "1963 cod otolith exchange," by A. C. Kohler; "The effect of catch size on the selectivity of otter trawls," by V. M. Hodder and A. W. May; "Electronic flash photography of Gadoid otoliths," by R. W. Blacker; "Redfish above the ocean depths," by G. P. Zakharov; "Abundance, age composition of landings, and total mortality of haddock caught off southern Nova Scotia, 1956-1961," by R. C. Hennemuth, M. D. Gros-slein, and F. D. McCracken; "Discrepancies between auto-lab and N. I. O. salinometers," by R. A. Cox and A. R. Folkard; "Two mechanical aids for otolith reading," by B. C. Bedford; "A method of preparing photographs and transparencies of cod otoliths," by J. Messtorff; "Hydrographic conditions off the coasts of Labrador and Newfoundland in November-December 1962," by J. W. Ramster; "Estimating the natural mortality rate of the sea scallop (*Placopecten magellanicus*)," by Arthur S. Merrill and J. A. Posgay; and "Adult redfish in the open ocean," by G. T. D. Henderson and D. H. Jones.

(International North Pacific Fisheries Commission) Annual Report, 1963, 173 pp., illus., printed, 1964. International North Pacific Fisheries Commission, 6640 NW, Marine Dr., Vancouver 8, B. C., Canada. This is the tenth consecutive annual report of the International North Pacific Fisheries Commission, established by a Convention between Canada, Japan, and the United States on June 12, 1953, for the purpose of promoting and coordinating the necessary scientific studies and to recommend the required conservation measures in order to secure the maximum sustained productivity of fisheries of joint interest. The report contains summary accounts of the annual meeting of the Commission held in Tokyo, Nov. 18-23, 1963, of an informal meeting, Oct. 4, 1963, and of an interim meeting held in Tokyo, Feb. 5, 1963; and a brief resume of administrative activities during the year. It also presents summaries prepared by the three national research agencies of investigations which they carried out under the planning and coordination of the Commission. Of principal concern are the salmon, halibut, herring, and king crab fisheries.

(North Pacific Fur Seal Commission) Proceedings of the Seventh Annual Meeting, February 24-27, 1964, Moscow, U.S.S.R., 28 pp., processed, Dec. 1964. Secretary, North Pacific Fur Seal Commission, U. S. Fish and Wildlife Service, Washington, D. C. 20240. The North Pacific Fur Seal Commission was established in January 1958, during a meeting held in Washington, D. C. The Commission was organized pursuant to the Interim Convention on Conservation of North Pacific Fur Seals, signed by the Governments of Canada, Japan, the U.S.S.R., and the United States in Washington, D. C., on February 9, 1957. The Convention came into force on October 14, 1957. This report contains a summary of the Seventh Annual Meeting, a report of the Standing Scientific Committee, a list of participants at the meeting, and the administrative report of the Secretary to the Seventh Meeting.

IRAQ:

Foreign Trade Regulations of Iraq, by Jackson B. Hearn, OBR 64-131, 8 pp., printed, December 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Iraq's trade policy is designed to protect domestic industry, provide commodities considered essential to the domestic economy, limit imports of less essential items, control prices, and increase the share of Iraqi nationals in the country's trade. In addition to trade policy, the report discusses the import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import controls, Iraq's export controls, United States foreign trade controls, and Government representation between the two countries.

IRRADIATION PRESERVATION:

Irradiation Preservation of Fresh-Water Fish and Inland Fruits and Vegetables, by John A. Emerson and others, Report No. COO 1283-12, 86 pp., printed, August 1964. U. S. Atomic Energy Commission, Washington, D. C. 20545.

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Articles, Food Technology, vol. 18, June 1964, printed; Garrard Press, 510 N. Hickory, Champaign, Ill.:

"Irradiation preservation of Pacific Coast shellfish. I--Storage life of king crab meats at 33° and 42° F.; II--Relation of bacterial counts, trimethylamine and total volatile base to sensory evaluation of irradiated king crab meat," by D. Miyauchi and others, pp. 138-147.

"Preservation of fresh unfrozen fishery products by low-level radiation. Parts I, II, III," by Richard O. Brooke and others, pp. 112-120.

ITALY:

Foreign Trade Regulations of Italy, by Fernand La-vallee, OBR 64-139, 8 pp., printed, December 1964. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The Italian Government includes an export promotion program in its broad economic planning and concurrently encourages imports as a means of providing necessary foodstuffs, raw materials, and industrial equipment to keep domestic prices down or enlarge and modernize the country's manufacturing facilities. In addition to trade policy, the report discusses Italy's import tariff system, sales and other internal taxes, shipping documents, and labeling and marking requirements. It also covers special customs provisions, nontariff import controls, Italy's export controls, United States foreign trade controls, and Government representation between that country and the United States.

"El mercado Italiano de conservas de pescado" (The Italian canned fish market), article, Industria Conservera, vol. 30, no. 302, Aug. 1964, p. 209, printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

JAPAN:

"Oceanography in Japan," by O. V. Kol'man, article, Okeanologiya, vol. 3, no. 3, 1963, pp. 559-564, printed in Russian. Okeanologiya, Akademiia Nauk SSSR, Moscow, U.S.S.R.

LABELING:

National Association of Frozen Food Packers Program of Labeling Practices for Labeling in the Consumer Benefit, 183 pp., illus., processed, 1964, price available from publisher. National Association of Frozen Food Packers, 919 18th St. NW., Washington, D. C. 20006. The manual presents a program for uniform and consistent placement of required information and helpful guidelines on voluntary labeling matters concerning frozen foods that reflect good commercial practice. It calls for the placement of essential and helpful information on three consecutive panels of the package so that the shopper will always know where to find the information she seeks. They are designated as: (1) The Shopper's Panel (main display panel) which is to carry the product name, net quantity, and name of packer or distributor, plus informative terms about the style, size, tenderness, variety, quality, and kitchen-ease of the product (ready to cook, pre-

cooked, prebaked); (2) The Composition Panel (front riser panel) where the statement of ingredients is to be made; and (3) The Family Panel (bottom of package) where helpful information is to be presented on handling the product, opening the package, cooking or preparing the product, innovations for serving, number of servings, and nutritional quality. The manual, containing labeling profiles for more than 200 kinds and styles of frozen foods, is presented in looseleaf form in order to allow the inclusion of additional and substitute materials as the occasion may arise. Labeling profiles for frozen fishery products will be added later.

LAKE ERIE:

Lake Erie Sport Fishing Survey, by Myrl Keller, Publication W-316, 19 pp., printed, 1962. Division of Wildlife, Ohio Department of Natural Resources, Columbus, Ohio.

LINGCOD:

Deamination of Adenine and Related Compounds and Formation of Deoxyadenosine and Deoxyinosine by Lingcod Muscle Enzymes, by H. L. A. Tarr and A. G. Comer, FRB Studies No. 894, 7 pp., printed. (Reprinted from Canadian Journal of Biochemistry, vol. 42, 1964, pp. 1527-1533.) Technological Research Laboratory, Fisheries Research Board of Canada, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

LOBSTER:

Contribuição para o Conhecimento da Pesca e da Biologia do Lagostim (NEPHROPS NORVEGICUS L.) na Costa Portuguesa (Contribution to the Knowledge of the Fishery and the Biology of the Norway Lobster--*Nephrops norvegicus* L.--off the Portuguese Coast), by Maria Jose de Figueiredo and Ivone Ferreira Barraca, Notas e Estudos do Instituto de Biologia Maritima No. 28, 44 pp., illus., printed in Portuguese with English summary. Instituto de Biologia Maritima, Lisbon, Portugal.

MACKEREL:

"O svyazi raspredeleniya i pitaniya skumbrii v severo-zapadnoi chasti Chernogo morya" (Relationship between distribution and feeding of mackerel in the northwestern part of the Black Sea), by A. V. Krotov, article, Referativnii Zhurnal-Biologiya, 1963, Abstract No. 17127, printed in Russian. Akademiia Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

MARKETING:

Seafood Merchandising--A Guide for Training Programs, OE-82014, 77 pp., illus., printed, 1964, 30 cents. Office of Education, U. S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) This bulletin suggests guidelines for the promotion and organization of training programs that will aid in the orderly flow of fishery products to the consumer. Chapter I, the seafood industry and its problems, discusses distribution channels, marketing problems, and need for education. Chapter II, organizing and operating a seafood merchandising program, covers briefly elements in the program, the coordinator, enlisting leaders, organizing the course, financial arrangements, personnel, materials, promotion, teaching approach and methods, course eval-

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uation, and other topics. Chapter III, curriculums for seafood merchandising training courses, outlines 9 different courses in retail seafood business for management and supervisory level personnel, operational level personnel, and for wholesaling, consumer educators, and mass feeders. Chapter IV, a sample seafood merchandising course, offers educational material on general fisheries information, product information, promotional activities for the seafood industry and seafood department, principles of salesmanship, and operating a seafood business. It also presents information on supervisory techniques; economics of seafood merchandising; nutritional value, preparation, and cooking of seafood; trends in seafood and its merchandising; and Government role in seafood merchandising.

MASSACHUSETTS:

From Division of Marine Fisheries, Massachusetts Department of Natural Resources, 15 Ashburton Pl., Boston 8, Mass.:

Annual Report, Fiscal Year July 1, 1963-June 30, 1964. 149 pp., illus., processed, Sept. 1, 1964. Discusses accomplishments of the Division of Marine Fisheries during the year ending June 30, 1964. Covers Marine Fisheries Advisory Commission meetings during 1964, lobster research and management, shellfish research and management, estuarine research program, appraisal and control of coastal alterations and marine engineering projects, finfish studies, and legislative studies. Includes statistical tables showing data on the lobster fishery; sea crab fishery; shore, net, and pound fishery, and Massachusetts fishery products landings. The appendixes contain information on a proposal for lobster research, the Federal Commercial Fisheries Research and Development Act of 1964, the proposed laboratory for Cat Cove, Salem, Mass., blackback flounder tagging data, and other subjects.

Report of the Department of Natural Resources Relative to the Coastal Wetlands in the Commonwealth, under Chapter 15 of the Resolves of 1963. Senate No. 855, 77 pp., illus., printed, Jan. 1964.

From Massachusetts Department of Commerce & Development, 150 Causeway St., Boston 14, Mass.:

Commercial Fishing--A Harvest of the Sea, 17 pp., illus., printed, 31 cents. Presents "a new look at Massachusetts' oldest industry." Describes the history of her fisheries from the time of the Pilgrims to the present day; the fishing grounds of Nantucket, Gulf of Maine, the Grand Banks, Georges Bank, and distant parts of the world frequented by her fishermen; the fishery resources of the State's waters; employment of 4,000 fishermen and 3,200 people in the processing industries; and economic importance of the fisheries. Also explains the gear used--otter trawls, purse seines, line trawls, and drift nets; the lobster fishery and its value; the scallop fishery and its principal port of New Bedford; modernization of vessels; and the promising future of her fisheries. Included are several recipes for cooking fish and shellfish--fillet of sole Amandine, scallop salad, fish chowder, baked haddock, scallops and rice, cod bean bake, fried ocean perch fillet, and ocean perch Amandine.

Massachusetts Salt Water Fishing Guide, 65 pp., illus., printed, 1964.

MEDITERRANEAN SEA:

"Conference on the study of the Mediterranean" (Oct. 1962), by L. M. Fomin article, *Okeanologiya*, vol. 3, no. 1, 1963, pp. 177-178, printed in Russian. *Okeanologiya*, Akademiia Nauk SSSR, Moscow, U.S.S.R.

The Fourth Mediterranean Expedition of R/V "Akademik S. Savilov" by Yu. E. Ochakovskii, JPRS 23281, 5 pp., processed. (Translated from the Russian, *Okeanologiya*, vol. 3, no. 3, 1963, pp. 550-554.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

MEXICO:

Foreign Trade Regulations of Mexico, by Walter Haidar, OBR 64-128, 8 pp., printed, December 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Mexico's trade policy emphasizes industrialization. Its industries and internal consumer markets are protected by high tariffs and by import controls. The report discusses Mexico's import tariff system, sales and similar internal taxes, documentation and fees, labeling requirements, and special customs provisions. Also covers nontariff import controls, Mexico's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

NAVIGATION AIDS:

"The first drifting radio-buoys," by Ya. Ya. Gakkal and L. P. Samsoniya, article, *Deep-Sea Research*, vol. 9, Nov./Dec. 1962, pp. 538-546, printed. (Translated from the Russian, *Okeanologiya*, vol. 1, no. 4, 1961, pp. 691-700.) Pergamon Press, 122 E. 55th St., New York, N. Y. 10022.

NETHERLANDS:

Selling in the Netherlands, by Jacobus T. Severiens, OBR 64-133, 16 pp., printed, December 1964, 15 cents. Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The Netherlands is an important customer of the United States, and excellent possibilities exist for expanding sales of many American products. The report explains the road to selling--import channels and requirements; industrial property rights; distribution practices; and transportation, port, and storage facilities. Also covers commercial practices, marketing aids, Netherlands Government procurement, United States export credit insurance and guarantees, and notes for business travelers on entrance requirements and living costs and conditions.

NETS:

"An inexpensive adaptation for plankton nets," by John W. Foerster, article, *Turtlex News*, vol. 42, no. 1, 1964, pp. 22-23, printed. General Biological Supply House, Inc., 8200 S. Hoyne Ave., Chicago, Ill.

NEW ZEALAND:

Report on Fisheries for 1963, 25 pp., printed, 1964. Marine Department, Wellington, New Zealand. Dis-

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cusses total New Zealand landings by class and by year, 1946-63; spiny lobster landings, 1954-63; fishing vessels and personnel; fish landings by species, 1962-63; methods of capture; landings at ports; foreign trade in fish and shellfish; sport fishing; fish-liver oil production; whaling, 1963 season; rock and dredged oysters; and production of toheroas (edible mollusc). Also covers whitebait fishing; mussel production; angling licenses; research and investigation--research vessel operations, grid-patterned trawling, marine fish studies, marine mammal projects, shellfish studies, survey of fishing grounds, trout fisheries, Quinal salmon, use of insecticides, and lake eutrophication and weed growth studies. Activities of the Fishing Industry Advisory Council, Freshwater Fisheries Advisory Council, and Fishing Industry Board; and legislation affecting fisheries are reported. Includes statistical tables on the number of fishing vessels and fishermen by port or district and method of fishing; quantity of fish and shellfish landed by port; quantity of fish landed by species and type of gear; landings by species and port; landings of fish and spiny lobsters by ports and months; and foreign trade in fishery products.

NORTH AMERICA:

The Book of Fishes; the Better-Known Food and Game Fishes and the Aquatic Life of the Coastal and Inland Waters of North America, edited by John Oliver La Gorce, 350 pp., illus., printed, 1961. The National Geographic Society, 17th and M Sts. NW., Washington, D. C.

NORTH PACIFIC OCEAN:

Oceanological Studies in the North Pacific, by D. E. Gershonovich, JPRS 24313, 5 pp., processed. (Translated from the Russian, *Okeanologiya*, vol. 3, no. 6, pp. 1119-1123.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

NORTHWEST ATLANTIC OCEAN:

Fishes of the Western North Atlantic, Part 3, 597 pp., illus., printed, 1964, \$27.50. Sears Foundation for Marine Research, Bingham Oceanographic Laboratory, Yale University, New Haven, Conn. This volume includes studies of nearly 100 species in 35 genera of "bony fishes." In addition to the descriptive details and discussion of orders, suborders, families, genera, and species, the key and synopses relate distinguishing characteristics that aid identification. Details, aside from the description of the species itself include color, size, development, habitat, general habits, food, parasites, predators, sporting qualities, range, abundance, and commercial importance. Some of the species covered are salmon, trout, tarpon, char, anchovies, and herring.

NORWAY:

Foreign Trade Regulations of Norway, by Grant Olson, OBR 64-137, 8 pp., printed, Dec. 1964. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Norway's trade policy is aimed at expanding its foreign trade and shipping services. Exports of fresh and frozen fish are subject to the license control of the Fish Transport Division of the Ministry of Fisheries; canned fish come under the licensing control of the Fish

Canneries Export Committee. However, licenses for those products are issued automatically. In addition to trade policy, the report discusses Norway's import tariff system, sales and other internal taxes, shipping documents, and labeling and marking requirements. It also covers special customs provisions, nontariff import controls; Norway's export controls, United States foreign trade controls, and Government representation between that country and the United States.

"Lønnsomheten av fisket med motorbåter under 40 fot in 1962" (Profitability of fishing with motorboats under 40 feet in 1962), article, *Fiskets Gang*, vol. 50, no. 49, Dec. 3, 1964, pp. 717-732, illus., printed in Norwegian, Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

NUTRITION:

"Studies with the use of fish oil fractions in human subjects," by Kunitaro Imaichi and others, article, *American Journal of Clinical Nutrition*, vol. 13, Sept. 1963, pp. 158-168, printed, *American Journal of Clinical Nutrition*, 49 W. 45th St., New York, N. Y. 10036.

OCEANOGRAPHY:

Data Report Equalant I, Volume I, 284 pp.; Volume II, Publication G-3, 790 pp., illus., printed, 1964, \$5.50 and \$5, respectively. National Oceanographic Data Center, Washington, D. C. 20390.

Data Report Equalant II, NODC Publication G-5, 754 pp., illus., printed, 1964, \$5. U. S. Naval Oceanographic Office, Washington, D. C. 20390.

"Djuphavsslätter och djuphavsgravar" (Deep-sea plains and deep-sea trenches), by Auguste Piccard, article, *Svenska Västskustfiskaren*, vol. 35, no. 1, Jan. 10, 1965, pp. 8-10, illus., printed in Swedish, Svenska Västskustfiskarnas Centralförbund, Ekonomiutskottet Postbox 1014, Göteborg 4, Sweden.

Economic Benefits from Oceanographic Research (a Special Report of the Committee on Oceanography), Publication 1228, 56 pp., printed, 1964, \$2. Printing and Publishing Office, National Academy of Sciences/National Research Council, Washington, D. C. 20418. This report attempts to estimate some of the future economic benefits that could result from oceanographic research, and to compare them with the cost of doing the research. These benefits are of two kinds: annual savings in costs of goods and services, and increases in production. The report discusses anticipated benefits of oceanographic research in fisheries production, marine minerals, marine recreation, ocean shipping, long-range weather forecasting, sewage disposal, international cooperation, and national defense. Rational development of the United States domestic fisheries could result in doubling the production in 15 years, state the authors.

Geo Marine Technology, vol. 1, no. 2, Dec. 1964/Jan. 1965, 52 pp., illus., processed, INTEL, Inc., 739 National Press Bldg., Washington, D. C. 20005. Contains, among others, articles on: "Data processing at sea," by Robert M. O'Hagan; "U.S.C.G.-175-year history of working at sea," by E. John Long; "Mesoscaphe"; "Winch Buoys"; and "Russian Oceanography."

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An International Directory of Oceanographers (Fourth Edition), compiled by Richard C. Vetter, 283 pp., processed, 1964. Printing and Publishing Office, National Academy of Sciences/National Research Council, 2101 Constitution Ave. NW., Washington, D. C. 20418. The publication of the fourth edition of the Directory four years after the previous edition (rather than the customary five) is evidence of accelerated world-wide oceanographic activities. The primary purpose of the Directory continues to be to assist oceanographers in corresponding with or visiting their colleagues in other countries. The lists are informal, unofficial, and do not constitute a complete directory of all who might be identified as oceanographers. The main criteria for inclusion are an individual's active participation in oceanographic programs and publication in scientific journals. Included are the names, addresses, and principal fields of 2,563 people in the biological, physical geological, chemical, engineering, and administration branches of oceanography, listed by country. A new feature is an appendix containing addresses of most of the large international organizations dealing with the marine sciences.

Life in the Sea, Photography: Lennart Nilsson, Text: Gösta Jägersten, 184 pp., illus., printed, 1964, \$10. Basic Books, 404 Park Ave. S., New York, N. Y. 10016. To many of us the sea has always been a mysterious universe seen mostly superficially or from afar. We know something of the large animals that inhabit the sea, but little or nothing of its smaller creatures. In this book the diverse and romantic small animals of the sea are explored by a photographer and a zoologist. The wedding of text and photographs gives a closeup of the smaller and less-known creatures to be found in the sea. The use of everyday language makes this book valuable as a general introduction to many of the unknown creatures of the sea, but its artistic presentation makes it an aesthetic addition to any library. A more intimate view of the sea is the general purpose of the book. The preface explains that its principal aim is to give the interested layman a picture of the rich "lower" world of "mainly smaller forms of marine life." Some of the creatures included in this book have never before been photographed and published either in popular or scientific publications, according to the author of the text. Also, all of the pictures are of living specimens. Described and illustrated with photographs (a few in color) are unicellular organisms; sponges; Cnidaria (hydrozoans, jellyfish, and coral); comb jellies or sea-gooseberries; flat worms and round worms; Myxostomida (parasites living on spiny-skinned animals); bristle worms; Protodrilus (thread-like segmented worms) and wave-washed sand; crustaceans; sea spiders; molluscs; moss animals; spiny-skinned animals (such as starfish); invertebrate relatives of the vertebrates (such as sea squirts); and the pipefish and its habitat. Each chapter has a clear explanation and photographic illustrations. Included is a short discussion of the habitat in which they live. As an example of how a complex subject is presented in clear everyday language, this is how the discussion on sea-gooseberries or comb jellies begins: "If one studies the contents of a plankton net, one may find, in addition to great numbers of small organisms, many transparent lumps of jelly about the size and shape of a gooseberry. Transfer them carefully

to a jar of water and it will be seen that they are animals which, if uninjured and left in peace for a time, stretch out a pair of long, somewhat branched tentacles from two pockets situated on opposite sides of the body." Anyone interested in the sea should have a copy of this book.

-J. Pileggi

On the Limits of Accuracy in the Echo Soundings of Ocean Regions, by H. Gabler, Trans-107, 15 pp., printed. (Translated from the German, *Deutsche Hydrographische Zeitschrift*, vol. 12, no. 6, 1959, pp. 229-243.) Naval Oceanographic Office, Department of the Navy, Washington, D. C. 20240.

Most Efficient Use of Scientific and Information Materials in the Field of Oceanology, by V. A. Polushkin, JPRS 23281, 3 pp., processed. (Translated from the Russian, *Okeanologiya*, vol. 3, no. 3, 1963, pp. 537-539.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Oceanographic Computer Programs for the Programmed Data Processor-5, by Robert M. O'Hagan, Oceanographic (Unpublished) Manuscript, 44 pp., processed, Oct. 15, 1964, limited distribution. U. S. Coast Guard Oceanographic Unit, Washington, D. C. 20220.

Oceanographical Observations in the Indian Ocean in 1961, H.M.A.S. DIAMANTINA (Cruise Dm 3/61), Oceanographical Cruise Report No. 11, 218 pp., illus., processed, 1964. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

"Organic aggregates in seawater and the dynamics of their formation and utilization," by Gordon A. Riley, article, *Limnology and Oceanography*, vol. 8, no. 4, 1963, pp. 372-381, printed. *Limnology and Oceanography*, K. M. Rae, c/o George H. Lauss, University of Michigan, Ann Arbor, Mich.

"Who will own the ocean's wealth?" by William J. Cromie, article, *United States Naval Institute Proceedings*, vol. 91, no. 1, Jan. 1965, pp. 52-61, illus., printed, single copy 75 cents. United States Naval Institute, Annapolis, Md. As long as no one used the world ocean for anything but an inexpensive highway and a barrier against enemies, there was little interest in owning part of it. Freedom of the sea was an easy doctrine to preach and to maintain. But now that nations are convinced that the water world contains valuable resources, they are gradually encroaching upon this freedom. A struggle for ownership of the ocean is arising, and a new law of the sea is gradually taking form. This article documents the disputes among many nations for control of the sea's resources, both mineral and animal. The author suggests that a respected international agency would be a buffer against explosive national tempers and could attempt compromise solutions to such disputes. It could coordinate and sponsor research and development. The agency could also be given power to grant exploration and exploitation leases, and to control and monitor disposal of radioactive and other wastes.

The following reports of the U. S. Program in Biology, International Indian Ocean Expedition, are available from the Woods Hole Oceanographic Institution, Woods Hole, Mass.:

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Narrative Report: Anton Bruun Cruise 2, News Bulletin No. 3, 16 pp., illus., processed, Jan. 1964.

Narrative Report: Anton Bruun Cruise 3, News Bulletin No. 4, 11 pp., illus., processed, Feb. 1964.

Narrative Report: Anton Bruun Cruise 4-A, News Bulletin No. 5, 28 pp., illus., processed, March 1964.

Narrative Report: Anton Bruun Cruise 4-B, News Bulletin No. 6, 22 pp., illus., processed, April 1964.

Narrative Report: Anton Bruun Cruise 5, News Bulletin No. 7, 14 pp., illus., processed, Oct. 1964.

Narrative Report: Anton Bruun Cruise 6, News Bulletin No. 8, 8 pp., illus., processed, Dec. 1964.

Narrative Report: Anton Bruun Cruise 7, News Bulletin No. 9, 14 pp., illus., processed, Jan. 1965.

The following reprints are available from the Woods Hole Oceanographic Institution, Woods Hole, Mass. 02543:.

Adsorption of Phosphates onto Bubbles, by E. R. Baylor, W. H. Sutcliffe, and D. S. Hirschfeld, Contribution No. 1259, 5 pp., illus., printed. (Reprinted from Deep-Sea Research, vol. 9, no. 2, 1962, pp. 120-124.)

Dissolved Organic Matter in Seawater as a Source of Particulate Food, by E. R. Baylor and W. H. Sutcliffe, Jr., Contribution No. 1383, 3 pp., illus., printed. (Reprinted from Limnology and Oceanography, vol. 8, no. 4, Oct. 1963, pp. 369-371.)

Sea Surface Chemistry and Langmuir Circulation, by William H. Sutcliffe, Jr., Edward R. Baylor, and David W. Menzel, Contribution No. 1346, 11 pp., illus., printed. (Reprinted from Deep-Sea Research, vol. 10, 1963, pp. 233-243.)

The following articles are from Okeanologiya, vol. 3, 1963. Okeanologiya, Akademiia Nauk SSSR, Moscow, U.S.S.R.:

"Float for oceanographic research," by I. V. Faren-gol'ts, no. 4, p. 753.

"A flying oceanographic laboratory," by L. I. Itskevich, no. 5, p. 944.

"New bottom relief charts of the Pacific Ocean," by G. B. Udintsev, no. 1, pp. 169-175.

"Oceanographic vessels of the world," by L. I. Itskevich, no. 4, p. 758.

"Second Atlantic Expedition of the Academy of Sciences of the U.S.S.R. of the ships Sergei Vavilov and Petr Lebedev," by Yu. Yu. Zhitkovskii, no. 4, pp. 749-750.

ODOR ABATEMENT:

Is it Possible to Avoid the Smell from the Herring Meal Plants? by E. Gloppestad, G. Sand, and E. Arneson, Translation Series No. 161, printed. (Translated from the Norwegian, Medlinger fra Sildolje - og Sildemelindustrie Forsknings - Insti-

tutt, No. 4, 1953.) Technological Station, Fisheries Research Board of Canada, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

OYSTERS:

"Maintenance of oyster cells In Vitro," by Frank O. Perkins and R. Winston Menzel, article, Nature, vol. 204, no. 4963, Dec. 12, 1964, pp. 1106-1107, printed, single copy 6s. (about 85 U. S. cents). St. Martin's Press, Inc., 175 Fifth Ave., New York, N. Y. 10010.

Nucleotides of the Pacific Oyster CRASSOSTREA GIGAS (Thunberg), by V. Wylie and M. Smith, FRB Studies No. 880, 4 pp., illus., printed. (Reprinted from Canadian Journal of Biochemistry, vol. 42, 1964, pp. 1347-1351.) Technological Research Laboratory, Fisheries Research Board of Canada, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

Oysters and Oyster Culture in Norway, by Torbjorn Gaarder, and Paul Bjerkan, Translation Series No. 217, 96 pp., printed. (Translated from the Norwegian, Jon Griegs Boktrykkeri, Bergen, Norway, 1934.) Atlantic Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B., Canada.

The following reprints from Proceedings of the National Shellfisheries Association, vol. 53, 1962, are available from the Virginia Institute of Marine Science, Gloucester Point, Va.

Oyster Mortality Studies in Virginia. IV--MSX in James River Public Seed Beds, by Jay D. Andrews, Contribution No. 155, pp. 65-84, illus., processed.

Studies on Oyster Scavengers and Their Relation to the Fungus DERMOCYSTIDIUM MARINUM, by Hinton Dickson Hoese, Contribution No. 162, pp. 161-174, illus., processed.

PANAMA:

"Potencialidad de la industria pesquera en Panamá" (Potential of the fishing industry in Panama), by Lenin Sucre Benjamin, article, Pesca y Marina, vol. 16, no. 6, Dec. 1964-Jan. 1965, pp. 14-15, printed in Spanish. Fernando Flores Limitada, 705 N. Windsor Blvd., Los Angeles 38, Calif.

PHYSIOLOGY:

"Critical contribution to the methods of evaluating the body-scale relation in studies of growth in fishes," by Milan Penaz, article, Zoologicki Listy, vol. 11, no. 1, 1962, pp. 77-80, printed in Czechoslovak, Českoslovensha Akademie, Ved Zoologicka, Komise, Nove Mestv, Vodickova 40, Prague 1, Czechoslovakia.

The Effect of Certain Physical Factors on the Sensitivity of Fish, E. Yu. A. Kholodov and K. B. Akhmedov, OTS 52-11771, 6 pp., processed. (Translated from the Russian, Biologiya Belogo Morya, vol. 1, 1962, pp. 256-261.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

PIRANHAs:

Survival Potential of Piranhas in Florida, by Martin A. Moe, Jr., Contribution No. 79, 14 pp., illus., printed. (Reprinted from Quarterly Journal of the Florida Academy of Sciences, vol. 27, no. 3, Sept. 1964, pp. 197-210.) Marine Laboratory, Florida Board of Conservation, St. Petersburg, Fla.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

PLAICE:

"Variations in plaice fecundity in the Clyde area," by T. B. Bagenal, article, *Journal of the Marine Biological Association of the United Kingdom*, vol. 43, no. 2, 1963, pp. 391-399, printed, Cambridge University Press, 32 E. 57th St., New York, N. Y. 10022.

PLANKTON:

The Open Sea: Its Natural History. Part I--The World of Plankton, by Alister Hardy, 322 pp., illus., printed, 1965, \$12.50. Houghton Mifflin Co., 2 Park St., Boston 7, Mass.

Selected Articles on Plankton Studies, OTS 63-11106, 58 pp., illus., processed, 1964, 50 cents. (Translated from the Russian, *Nauchnye Doklady Vysshei Shkoly, Biologicheskii Zhurnal*, vol. 40, no. 1, 1961, pp. 122-128; *Trudy Murmanskogo Morskogo Biologicheskogo Instituta*, no. 2 (6), 1960, pp. 68-113.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230. Contains: "A modification of the Brodskii-Baskakov method for rapid plankton count" (Modifikatsiya metoda Brodskogo-Baskakova dlya bystrogo scheta planktona), by B. M. Mednikov; "High-speed plankton net" (Skorostnaya planktonicheskaya set'), by V. A. Yasnov; and "Long-term dynamics of the plankton biomass in the southern Barents Sea and the factors determining it" (Mnogoletnyaya dinamika biomassy planktona yuzhnoi chasti Barentseva morya i faktory, ee opredelyayushchie), by E. A. Zelikman and M. M. Kamshilov.

POLAND:

"The Committee for Marine Research of the Polish Academy of Sciences," by M. Mysolowski, article, *Okeanologiya*, vol. 3, no. 3, 1963, pp. 558-559, printed in Russian, *Okeanologiya, Akademiia Nauk SSSR*, Moscow, U.S.S.R.

"Goals of the fishing industry," by Jerzy Grajter, article, *Translations on East European Agriculture Forestry and Food Industries No. 136*, JPRS 18367, pp. 86-91, processed, March 26, 1963, \$2.25. (Translated from the Polish, *Tygodnik Morski*, vol. 6, no. 5, 1963, pp. 1, 4.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

The following translations are for sale by the Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.:

Fish Industry in 1962, JPRS 19557, 8 pp., processed, June 4, 1963, \$2.25. (Translated from the Polish, *Gospodarka Rybna*, vol. 15, no. 3, 1963, pp. 21-23.)

Quota Fulfillment by Fish Industry, JPRS 17768, 5 pp., processed, Feb. 21, 1963, \$2.75. (Translated from the Polish, *Gospodarka Rybna*, vol. 14, no. 9, Dec. 1962, pp. 27-28.)

POLLOCK:

"Parasitic infestation of the Alaskan pollack in relation to its utilization as a food fish," by A. V. Gusev, E. V. Zhukov, and Yu. A. Strelkov, article, *Translations of Doklady Biological Sciences Sections*, vol. 125, nos. 1-6, pp. 344-346, printed. (Translated from the Russian, *Doklady Akademii Nauk SSSR*,

vol. 125, no. 5, 1959, pp. 1174-1176.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

POND FISHERIES:

Fish Dealers, compiled by Al Lopinot, Fish Mgt. Mimeo No. 16, 4 pp., processed, April 1964, Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706. Lists names and addresses of dealers throughout the United States who raise and supply fish for pond and lake stocking purposes, and species and sizes handled by each dealer.

"Increasing the fish productivity of rearing ponds by the use of fertilizers," by L. I. Mamontova, article, *Doklady Moskov. Sel'skokhoz. Akad. Im. K. A. Timiryazeva*, vol. 69, 1961, pp. 171-174, printed in Russian, *Doklady Moskov. Sel'skokhoz. Akad. Im. K. A. Timiryazeva*, Moscow, U.S.S.R.

PORTUGAL:

"Nuevas perspectivas en el sistema Portugues de comercializacion de las conservas de pescado" (New outlook in the Portuguese system of marketing canned fish), article, *Industria Conservera*, vol. 30, no. 302, Aug. 1964, pp. 213-214, printed in Spanish, Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

PROCESSING:

"Mechanization of the preliminary processing of salted herring (at the Kaliningrad fish collective)," by M. M. Piletskii, article, *Raboty Rybokhozyaistvennoi Laboratorii Voronezhskogo Universiteta*, vol. 2, 1962, pp. 62-71, printed in Russian, *Raboty Rybokhozyaistvennoi Laboratorii Voronezhskogo Universiteta*, Voronezh, U.S.S.R.

Regulations on Certain Sea Food Processing Industries in Mediterranean Countries, by D. Remy, GFCM Studies and Reviews No. 24, 32 pp., processed in English (French version also available), Sept. 1964, General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. Sections on semipreserves, salting, smoke curing, and dry curing each discuss definitions, species used, processing standards, and packaging. Countries concerned are France, Greece, Morocco, Spain, Tunisia, Turkey, and Yugoslavia.

QUALITY:

Elintarvikkeiden Aistinarvostelumenetelmista (On sensory testing methods), by Alpo Siirila and Olavi E. Nikkila, Tiedotus, Sarja IV, Kemia 62, 40 pp., illus., processed in Finnish with English summary, 1964, Valtion Teknillinen Tutkimuslaitos, Lonnrotinkatu 37, Helsinki, Finland. Discusses sensory testing methods in the production, development, and research work of foodstuffs. In a short survey of the senses and their activity, the possibilities and limits of subjective evaluation are described.

RADIOACTIVE WASTES:

Radioactive Contamination of the Seas and Oceans, USSR, by K. N. Fedorov and others, JPRS 26, 002, 109 pp., processed, Aug. 20, 1964, \$4. (Translated from the Russian, *Radioaktivnaya Zagryaznenost'*

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More i Okeanov, Moscow, U.S.S.R., 1964.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

RESEARCH VESSEL:

Articles from *Okeanologiya*, printed in Russian; *Okeanologiya*, Akademiia Nauk SSSR, Moscow, U.S.S.R.:

"A new oceanographic research vessel, *Jalanidhi*, of Indonesia," by N. A. Skryagin, vol. 4, no. 1, 1964, pp. 186-188.

"A new U. S. Navy research vessel, *James M. Gillis*, for oceanographic work," by V. G. Samarín, vol. 3, no. 6, 1963, pp. 1123-1125.

Selection of Type of an Oceanographic Research Vessel, by I. A. Stoyanov, JPRS 25068, 8 pp., processed, (Translated from the Russian, *Okeanologiya*, vol. 4, no. 2, 1964, pp. 342-349.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

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Possibility of Exploiting the Fishery Resources of the World Ocean, by T. S. Rass, OTS 64-21588, 5 pp., processed, 1964. (Translated from the Russian, *Okeanologiya*, vol. 3, no. 3, 1963, pp. 495-499.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

ROUGHFISH:

Rotenone for Eradication of Undesirable Fish in Management of Lakes and Ponds, Fisheries Leaflet No. 5, 3 pp., printed, 1960. Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

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"Approach from population dynamics to ratio of salmon falling off gill nets," by Takayuki Doi, article, *Bulletin of the Tokai Regional Fisheries Research Laboratory*, vol. 34, 1962, pp. 13-18, printed in Japanese. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan.

"Biology of the pink salmon of the White Sea," by F. B. Mukhomediyaarov, article, *Problemy Ispol'zovaniya Promyslovnykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii*, vol. 1, 1963, pp. 49-52, printed in Russian. *Problemy Ispol'zovaniya Promyslovnykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii*, Akademiia Nauk SSSR, Moscow, U.S.S.R.

"A few notes of migration groups by analysis of scale patterns on the pink salmon, *Oncorhynchus gorbuscha*," by Tetsuo Ogata, article, *Bulletin of the Japan Sea Regional Fisheries Research Laboratory*, no. 13, 1964, pp. 15-24, printed. Japan Sea Regional Fisheries Research Laboratory, Miigata, Northwest Honshu, Japan.

"An investigation of louver as a method of guiding juvenile Pacific salmon," by C. P. Ruggles and P. Ryan, article, *The Canadian Fish Culturist*, issue 33, Nov. 1964, 68 pp., illus., printed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

"Materialy o réchnom periode zhizni simy" (Data on the river stage of the salmon *Oncorhynchus masu*), by M. L. Krykhtin, article, *Izvestia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khoz'yaistva i Okeanografii*, vol. 48, 1962, pp. 84-132, printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010.

"Method of breeding young salmon in Northern Caucasus," by A. E. Tamarin, article, *Raboty Rybkhozhyaistvennoi Laboratorii Voronezhskogo Universiteta*, vol. 2, 1962, pp. 3-10, printed in Russian. Raboty Rybkhozhyaistvennoi Laboratorii Voronezhskogo Universiteta, Voronezh, U.S.S.R.

Symposium on Pink Salmon, edited by N. J. Wilimovsky, H. R. MacMillan Lectures in Fisheries, 226 pp., illus., printed, 1962. Institute of Fisheries, University of British Columbia, Vancouver 8, B. C., Canada. Contains the text of papers presented and pertinent discussions at a symposium held at the University of British Columbia, Oct. 13-15, 1960. Included are: "The observed fluctuations of pink salmon in British Columbia," by Ferris Neave; "Pink salmon fluctuations in Alaska," by William F. Royce; "Some problems of the pink salmon fisheries in Asian waters," by Kisaburo Taguchi; "Pink salmon populations of the Fraser River System," by E. H. Vernon; "Freshwater survival of pink salmon at Sashin Creek, Alaska," by Theodore R. Merrell, Jr.; "Environmental variability and reproduction potentials of pink salmon in British Columbia," by W. P. Wickett; "Relation of stream temperatures to timing of pink salmon escapements in Southeast Alaska," by William L. Sheridan; "Marine factors affecting the survival of Fraser River pink salmon," by Philip Gilhouse; "Marine survival, distribution and migration of pink salmon (*Oncorhynchus gorbuscha*) off the British Columbia Coast," by J. I. Manzer and M. P. Shepard; and "Observations on pink salmon in the Aleutian Island Area 1956-1960," by Allan C. Hartt. Also included are: "Aspects of the marine biology of Asiatic pink salmon," by Teruo Ishida; "Differentiation of stocks," by Donald D. Worlund and Reynold A. Fredin; "Regulation of the abundance of pink salmon populations," by W. E. Ricker; "A concept of the dynamics of pink salmon populations," by Robert R. Parker; and "The relationship between numbers spawning and numbers returning in Pacific salmon," by W. F. Thompson.

"Vodosnabzhenie nerestovykh bugrov gorbushi i letnei kety" (Water supply of the redds of pink salmon and summer chum salmon), by I. S. Vasil'ev, article, *Nauchnye Doklady Vyshey Shkoly Biologicheskoe Nauki*, vol. 3, 1958, pp. 26-31, printed in Russian. Gosudarstvennoe Izdatel'stvo "Vysshiaia Shkola," Podsozskii per. 20, Moscow B-62, U.S.S.R.

"Will artificial propagation solve the problems of high dams and salmon?" by Wendell E. Smith, article, *U. S. Trout News*, vol. 9, no. 4, Nov.-Dec. 1964, pp. 5-6, 19, 21, 22, printed. U. S. Trout Farmers Association, 67 West 9000 South, Sandy, Utah 84070.

The following articles are from *Bulletin, Pacific Marine Fisheries Commission*, no. 6, 1963, Pacific Marine Fisheries Commission, 741 State Office Bldg., 1400 SW. 5th Ave., Portland 1, Oreg.:

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Availability of small salmon off the Columbia River," by H. Heyamoto, pp. 81-88, illus.

"Statistical methods for estimating California salmon landings," by Norman J. Abramson, pp. 6-12.

The following are available from Technological Research Station, Fisheries Research Board of Canada, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada:

Changes in the Multiple Hemoglobin Patterns of some Pacific Salmon, Genus ONCORHYNCHUS, during the Parr-Smolt Transformation, by W. E. Vanstone, Eve Roberts, and H. Tsuyuki, FRB Studies No. 884, 7 pp., illus., printed. (Reprinted from Canadian Journal of Physiology and Pharmacology, vol. 42, 1964, pp. 697-703.)

Formation of Purine and Pyrimidine Nucleosides, Deoxynucleosides, and the Corresponding Mononucleotides by Salmon Milt Extract Nucleoside Phosphorylase and Nucleoside Kinase Enzymes, by H. L. A. Tarr, FRB Studies No. 897, 11 pp., printed. (Reprinted from Canadian Journal of Biochemistry, vol. 42, 1964, pp. 1535-1545.)

SARDINES:

"L'assorbimento del sale e la sua diffusione nelle conserve di sardine all'olio" (The absorption of salt and its diffusion in canned sardines in oil), by R. Meesemaeker and Y. Sohler, article, Industria Conserve, vol. 39, no. 4, Oct.-Dec. 1964, pp. 301-306, illus., printed in Italian. Industria Conserve, Viale Tanara 33, Parma, Italy.

SAURY:

"More than 1 million centners of saury (from the conferences of Glavdal'vostokrybprom on the results of the saury fishery in 1962 and the prospects for the saury fishery in near future), article, Rybnaya Promyshlennost Dal'nego Vostoka, no. 2, 1963, pp. 2-10, printed in Russian. Rybnaya Promyshlennost Dal'nego Vostoka, Vladivostok, U.S.S.R.

SCALLOPS:

"Isolation of 22-Dehydrocholesterol from scallop," by T. Tamura and others, article, Canadian Journal of Biochemistry, vol. 42, Sept. 1964, pp. 1331-1337, printed. Canadian Journal of Biochemistry, The National Research Council, Sussex St., Ottawa 2, Canada.

SEALS:

"The ringed seal Phoca hispida pomorum Smirn in the Kara and Laptev Seas," by A. P. Golenchenko, article, Problemy Ispol'zovaniya Promyslovnykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii, vol. 1, 1963, pp. 156-160, printed in Russian. Problemy Ispol'zovaniya Promyslovnykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii, Akademiya Nauk SSSR, Moscow, U.S.S.R.

"Sel på Norskekysten fra Finnmark til Møre" (Seals on the Norwegian Coast from Finnmark to Møre), by Per Øynes, article, Fiskets Gang, vol. 50, no. 48, Nov. 26, 1964, pp. 694-707, illus., printed in Norwegian with English summary. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

The following articles are from New Scientist, vol. 24, single copy 1s. 3d. (about 20 U. S. cents). Cromwell House, Fulwood Pl., High Holborn, London WC1, England:

"Grey seals choose to be overcrowded," no. 416, Nov. 5, 1964, p. 342.

"Why the grey seal matters," by John Hillaby, no. 418, Nov. 19, 1964, pp. 502-503, illus.

SEAWEED:

"Seaweed: the facts and the fiction," by N. W. Pirie, article, New Scientist, vol. 23, July 23, 1964, p. 236, printed. Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

"Seaweeds--their uses as food and in industry," by J. Moore, article, Commercial Fishing, vol. 3, no. 4, Dec. 1964, pp. 26, 29-30, illus., printed. Trade Publications, Ltd., 47 Lewis Eady Bldg., Queen St., Auckland, New Zealand.

SEINING:

"Behaviour of sweep line in Danish seining. II," by Otohiko Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 30, Jan. 1964, pp. 21-28, printed in Japanese. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

SHARKS:

"Khishchniki morei i ikh promysel" (Predators of the seas and their economic importance), by N. V. Parin, Priroda, vol. 52, no. 12, 1963, pp. 62-68, illus., printed in Russian. Akademiya Nauk SSSR, M. Khariton'yevski per. 4, Moscow, U.S.S.R. Discusses the predatory habits of sharks. The utilization of shark meat, liver oil, fins, and skin is considered. The effects of sharks on the tuna industry are described together with methods for foiling their attacks. Man-eating sharks and factors affecting their attacks are discussed, and chemical repellents and biological and mechanical protective measures are considered. The author believes that none of the methods currently used is completely effective.

Vitamin A, Carotenoids and Total Lipids on the Livers of some Elasmobranchs, by L. R. Fisher, Marine Research 1964 No. 2, 18 pp., printed, May 1964, 6s. (about 85 U. S. cents). Department of Agriculture and Fisheries for Scotland, Edinburgh, Scotland. (For sale by Sales Section, British Information Services, 845 Third Ave., New York, N. Y. 10022.)

SHRIMP:

"How shrimps are canned at a New Orleans factory," by Elliot B. Dewberry, article, Food Manufacture, vol. 39, July 1964, pp. 35-39, printed. Grampian Press, Ltd., The Tower, Shepherds Bush Rd., Hammersmith, London W6, England.

"Studies on the physiology of a shrimp, Metapenaeus mastersii (Haswell) (Crustacea: Decapoda: Penaeidae), I--Blood constituents," by W. Dall, article, Australian Journal of Marine and Freshwater Research, vol. 15, no. 2, Nov. 1964, pp. 145-161, illus., printed, single copy 10/- (about US\$1.10). Editorial and Publications Section, Commonwealth Scientific and In-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

dustrial Research Organization, 372 Albert St., East Melbourne C2, Victoria, Australia.

SMALL BUSINESS MANAGEMENT:

Legal Aspects of Small Business Use of Cooperative Arrangements, by Stanley F. Hack, Management Research Summary, 2 pp., processed, 1964. Small Business Administration, Washington, D. C. 20416. Many small businesses have been able to lower costs and strengthen their marketing positions by entering into various cooperative arrangements. This report examines statutes and judicial decisions that have established guidelines for the opportunities in and restrictions on such agreements. The Capper-Volstead Act authorizes agricultural producers to form cooperatives for processing, preparing for market, handling, and marketing their products. The Fisheries Act grants similar privileges to fishermen. Activities most frequently challenged under both laws include conspiracies with non-cooperatives, boycotts, attempts to monopolize trade, and mergers.

SMELT:

"Age, growth, maturity, and sex composition of the American smelt, *Osmerus mordax* (Mitchill), of western Lake Superior," by Merryl M. Bailey, article, Transactions of the American Fisheries Society, vol. 93, no. 4, 1964, pp. 382-395, printed. American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

SMOKING:

"Smoking of fish in a high-tension current," by N. Shishkalova and V. Goncharov, article, Rybnaya Promyshlennost Dal'nego Vostoka, no. 1, 1963, p. 17, printed in Russian. Rybnaya Promyshlennost Dal'nego Vostoka, Vladivostok, U.S.S.R.

SOLE:

The following articles are from Bulletin, Pacific Marine Fisheries Commission, no. 6, 1963. Pacific Marine Fisheries Commission, 741 State Office Bldg., 1400 SW. 5th Ave., Portland 1, Oreg.

"Movements of petrale sole, *Eupsetta jordani* (Lockington), tagged off California," by Edgar Allan Best, pp. 23-28, illus.

"Results from tagging a spawning stock of Dover sole, *Microstomus pacificus*," by Sigurd J. Westheim and Alfred R. Morgan, pp. 14-21, illus.

SOUTH CAROLINA:

Annual Report, 1963-1964. Contributions from Bears Bluff Laboratories No. 41, 10 pp., illus., printed, Jan. 1965. (Reprinted from Report of South Carolina Wildlife Resources Department, Fiscal Year July 1, 1963-June 30, 1964.) Bears Bluff Laboratories, Wadmalaw Island, S. C. Discusses the accomplishments during the year ended June 30, 1964; the study of oysters, plankton, shrimp, finfish, fish kills, and pond cultivation. Also discusses operation of a new fishery research vessel.

SPAIN:

"Conclusiones generales de la Comision III--Ordenacion y expansion de la pesca e industrias derivadas" (General conclusions of Commission III--Or-

ganization and expansion of the fishery and byproducts industries), article, Boletin de Informacion, no. 72, September 1964, pp. 5-12, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6^a Planta, Madrid, Spain.

The following articles are from Industria Conservera, vol. 30, printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain:

"La industria conservera y la exportacion" (The canning industry and the export market), by Alevin, no. 302, Aug. 1964, p. 207, illus.

"Operaciones conserveras: las de la sardina y especies afines al arenque" (Canning operations: those of the sardine and species related to herring), no. 304, Oct. 1964, pp. 265-266.

"Ordenacion y expansion de la industria conservera Gallega" (Organization and expansion of the Galician canning industry), by Alevin, no. 305, Nov. 1964, pp. 291-294.

SPINY LOBSTER:

The following are from Commonwealth Scientific and Industrial Research Organization, 314 Albert St., East Melbourne C2, Victoria, Australia.:

The Southern Crayfish (JASUS LALANDII), by P. Grue, Translation No. 5380, 26 pp., printed. (Translated from the French, Australes et Antarctiques Francaises, no. 10, 1960, pp. 15-40.)

"The spiny lobster, *Jasus lalandei* (H. Milne-Edwards), in South Australia. II--Reproduction," by D. R. Fielder, article, Australian Journal of Marine and Freshwater Research, vol. 15, no. 2, Nov. 1964, pp. 133-144, illus., printed, single copy 10/- (about US\$1.10).

SPOILAGE:

Control of Bacterial Spoilage of Fish, by H. L. A. Tarr, 5 pp., printed. (Reprinted from Developments in Industrial Microbiology, vol. 5, 1964, pp. 135-139.) Technological Research Laboratory, Fisheries Research Board of Canada, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

SQUID:

"Mechanized squid jigger," by J. J. Quigley, article, Trade News, vol. 17, no. 5, Nov. 1964, pp. 3-5, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. The hand-line jigger used on Newfoundland's bait squid jigging grounds for centuries may soon be replaced by a new Japanese device. The mechanism consists of drum haulers mounted on the vessel railing, special lure hooks, and a light attraction system. Besides being more productive, the hauler eliminates the back-breaking work involved in the traditional jigging operation. With a machine for turning the drum, it should be possible for one man to operate as many as 10 lines of jiggers.

STERN TRAWLERS:

The following articles are from Construction and Running of Stern-Trawlers, Translation No. 813, printed. (Translated from the German, Hansa-Schiffahrt-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Schiffbau-Hafen, vol. 98, no. 23, 1961; Marine Laboratory, Department of Agriculture and Fisheries for Scotland, P. O. Box 101, Victoria Rd., Torry, Aberdeen, Scotland.:

"Operational experiences with stern trawlers," by J. Greiss.

"Stern trawlers and their fishing gear," by H. Heinsohn.

ST. PIERRE AND MIQUELON:

"L'avenir de la pêche aux îles Saint-Pierre-et-Miquelon" (The future of the St. Pierre and Miquelon Islands' fishery), by P. Schmitz, article, La Pêche Maritime, vol. 44, no. 1042, Jan. 1965, pp. 3-5, 6, printed in French, single copy 14 F (about US\$2.85). La Pêche Maritime, 190, Blvd. Haussmann, Paris 8^e, France.

STURGEON:

"Incubating sturgeon at a controlled temperature," by A. F. Gun'ko, L. T. Karpus', and P. A. Samsonenko, article, Translation of Doklady Biological Sciences Sections, vol. 141, nos. 1-6, pp. 1093-1094, printed. (Translated from the Russian, Doklady Akademii Nauk SSSR, vol. 141, no. 6, 1961, pp. 1512-1514.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

TAGGING:

Returns from the 1963 Schlitz Tagging Program, by Dale S. Beaumariage, Technical Series No. 43, 37 pp., illus., processed, Nov. 1964. Marine Laboratory, Florida State Board of Conservation, Maritime Base, Bayboro Harbor, St. Petersburg, Fla.

TARIFF AND TRADE:

Operation of the Trade Agreements Program, 15th Report, July 1962-June 1963, TC Publication 147, 152 pp., processed, 1964. United States Tariff Commission, Washington, D. C. 20436. During the period covered by the 15th report, the Trade Expansion Act of 1962 became law; the Congress thereby delegated to the President new authority to enter into trade agreements and to modify U. S. rates of duty to carry out such agreements. The members of the General Agreement on Tariffs and Trade (GATT) began preparing for the sixth round of multilateral trade-agreement negotiations--widely known as "the Kennedy round." The 20th Session of the Contracting Parties to the GATT was held in the fall of 1962. This report discusses in detail the Trade Expansion Act, developments relating to the General Agreement on Tariffs and Trade, actions of the United States relating to its Trade Agreements Program, and major commercial policy developments in countries with which the United States has trade agreements.

TERRITORIAL WATERS:

"O carácter duma disposição especial que permita alongar o limite do domínio público marítimo com vista aos interesses da pesca" (The character of the special situation which permits increasing the limit of the marine public domain with a view to the interests of the fishery), by Victor Augusto Pereira Nunes, article, Boletim da Pesca, vol. 16, no. 84, Sept. 1964, pp. 11-26, printed in Portuguese. Ga-

binete de Estudos das Pescas, R. S. Bento, 644, 4^o Esq., Lisbon, Portugal.

TILAPIA:

"Contribution a l'etude de l'adaptation des Tilapia (Pisces, Cichlidae) a la vie en milieu mal oxygene" (A contribution to the study of the adaptation of the Tilapia--Pisces, Cichlidae--to life in a poorly oxygenated environment), by J. Dusart, article, Hydrobiologia, vol. 21, nos. 3/4, 1963, pp. 328-341, printed in French, Hydrobiologia, Uitgeverij Dr. W. Junk, The Hague, Netherlands.

"Tilapia in the South Pacific," by L. C. Devambez, article, South Pacific Bulletin, vol. 14, no. 4, Oct. 1964, pp. 27-28, 52, illus., printed, single copy 30 cents. South Pacific Commission Publications Bureau, G. P. O. Box 5254, Sydney, Australia. Since 1954, various Tilapia species have been introduced into most of the South Pacific islands with notable success. This small fresh-water fish is unusually hardy, adaptable to widely different environments, a most prolific breeder, and valuable in mosquito control. The Tilapia is well suited to the role it plays in the South Pacific--to populate those waters which previously were very often empty and sometimes rather poorly equipped to support aquatic life--and to do this in the absence both of specialized staff and fish-culture establishments, according to the author.

TRAWLERS:

"The building of large fish trawlers," by E. M. Gorbunenko, article, LLU Translation Bulletin, vol. 2, no. 1, Jan. 1960, pp. 25-41, printed. (Translated from the Russian, Sudostroenie, no. 5, 1959, pp. 33-37.) National Lending Library for Science and Technology, Boston Spa, Yorkshire, England.

"News of the trawler Rubtsovsk. Interview with the captain of the SRT Rubtsovsk," by V. A. Voronkov, article, Rybnaya Promyshlennost Dal'nego Vostoka, no. 1, 1963, pp. 12-13, printed in Russian, Rybnaya Promyshlennost Dal'nego Vostoka, Vladivostok, U.S.S.R.

TRAWLING:

"Improved techniques for benthic trawling at depths greater than 2000 m.," by Robert J. Menzies, article, Antarctic Research Series. Vol. I--Biology of the Antarctic Seas, Publication 1190, pp. 93-109, illus., printed, 1964. National Academy of Sciences/National Research Council, Washington, D. C. 20418. Reviews deep-sea trawling techniques from the Porcupine (1869) to the Eltanin (1962), and presents records or little-known but useful techniques of deep-sea trawling. Subjects covered include dredges, trawls, ropes, wires, accumulators, wire kinking, and the successes of various deep-sea trawlings.

The following articles are from Raboty Rybokhozyaistvennoi Laboratorii Voronezhskogo Universiteta, vol. 2, 1962. Voronezh, U.S.S.R.:

"Automatic signals when the trawl is fouled," by A. S. Filimonov, p. 15.

"Variation in the rollers (on the medium trawlers)," by A. S. Filimonov, pp. 16-17.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

TROUT:

"Hematomas in trout," article, *Nutrition Review*, vol. 22, July 1964, pp. 208-210, printed. The Nutrition Foundation Inc., 99 Park Ave., New York, N. Y. 10016.

TUNA:

Bigeye Studies. II--A Consideration of the Size Composition of Bigeye Taken on Pole and Line, by Mitsuo Honma and Tadao Kamimura, 7 pp., printed. (Translated from the Japanese, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 20, no. 10, 1955, pp. 863-869.) Available on loan from Fisheries-Oceanography Library, University of Washington, Seattle, Wash. 98105.

The Biology of the Yellowfin Tuna, THUNNUS ALBACARES (Bonnaterre), in the Gulf of Guinea, by Gilbert W. Bane, Jr., Order No. 64-3702, 444 pp., 1963, microfilm \$5.65; Xerography \$20.05. University Microfilms, Inc., University of Michigan, 313 N. 1st St., Ann Arbor, Mich.

"Chile impulsa su industria atunera" (Chile develops its tuna industry), article, *Mundo Pesquero*, vol. 2, no. 15, Nov. 1964, p. 20, illus., printed in Spanish, single copy \$/ 6.00 (about 25 U. S. cents). Mundo Pesquero, Av. Oscar R. Benavides 1207 (Colonial), Lima, Peru.

Prospección y pesca de atunes en las costas de Provenza, Córcega y golfo de Génova (Exploration and fishery for tuna along the coasts of Provence and Corsica and in the Gulf of Genoa), by Pierre Gougelet, article, *Puntal*, vol. 11, no. 127, Oct. 1964, pp. 14-17, illus., printed in Spanish, single copy 12 ptas. (about 20 U. S. cents). Puntal, Apartado de Correos 316, Alicante, Spain.

Ships for Tuna Fishing (Statki do Polowow Tunczyka), by Jacek Forembski and Bohdan Pradzynski, OTS 63-11394, 11 pp., illus., processed, 1964. (Translated from the Polish, *Budownictwo Okretowe*, no. 3, 1961, pp. 90-92.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

TURKEY:

Balik ve Balıkçılık (Fish and Fishery), vol. 12, no. 12, Dec. 1964, 32 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G. M., Balıkçılık Mudurlugu, Besiktas, Istanbul, Turkey. Contains, among others, articles on: "Production of black caviar in Turkey and its problem (Part I)," by Cevdet Aygun; "Technological developments in the field of fish flour (Part I)," by Hikmet Akgunes; and "Synthetic fibres in the fishing industry (Part I)," by Necla Gurturk.

TURTLES:

"La protección de las tortugas marinas" (The protection of marine turtles), by Alberto Alvarez-Pinzon, article, *Iberica*, vol. 42, no. 28, Oct. 1964, pp. 376-378, illus., printed in Spanish, single copy 18 ptas. (about 30 U. S. cents). Iberica, Palau, 3, Apartado 759, Barcelona-2, Spain.

UNITED KINGDOM:

Directory and Equipment Guide, 1965, by Arthur J. Heighway and E. Melville Dougall, 184 pp., illus.,

printed, £1 12s. (about US\$4.50). Fishing News, 110 Fleet St., London EC4, England. This is a most comprehensive directory of the British fishery and allied industries of interest to all those concerned with the United Kingdom's fisheries and industry. It contains lists of fishing vessels, owners and managers, individual fleets, fishing craft in all United Kingdom ports, and builders of fishing vessels; propulsion, transmission, and steering equipment suppliers and manufacturers; electronics and radio equipment suppliers and manufacturers; chandlery and lifesaving equipment suppliers and manufacturers; catching and hauling equipment suppliers and manufacturers; and marketing and processing equipment manufacturers. It also includes lists of fishery officials, government organizations, and trade associations; and an alphabetical index of all suppliers and manufacturers. A complete change in format is evident in this fifth edition. Each section has an introductory article with information on the latest trends in that segment of the fishing industry. Included are full details of vital parts of important vessels launched or completed during the past 12 months; and a list of the abbreviations used for official fishery agencies.

U.S.S.R.:

"Fishing industry of the national reservoirs in the Voronezh region in 1958-60," by A. V. Fedorov and E. V. Afonyushkina, article, *Raboty Rybnokhozyaistvennoi Laboratorii Voronezhskogo Universiteta*, vol. 2, 1962, pp. 20-41, printed in Russian. Raboty Rybnokhozyaistvennoi Laboratorii Voronezhskogo Universiteta, Voronezh, U.S.S.R.

"La industria de la pesca en Rusia" (The fishing industry in Russia), article, *Informacion Conservera*, vol. 12, no. 129, Sept. 1964, pp. 363-364, printed in Spanish, single copy 30 ptas. (about 50 U. S. cents). Informacion Conservera, Colon, 62, Valencia, Spain.

"Progress of science in the fishing industry," by N. Novikov, article, *Rybnaya Promyshlennost Dal'nego Vostoka*, no. 1, 1963, pp. 7-10, printed in Russian. Rybnaya Promyshlennost Dal'nego Vostoka, Vladivostok, U.S.S.R.

"Red flag over the seven seas," by Hanson W. Baldwin, article, *The Atlantic Monthly*, vol. 214, no. 3, Sept. 1964, pp. 37-43, printed, single copy 75 cents. The Atlantic Monthly, 8 Arlington St., Boston, Mass. 02116. Contains a section on the Soviet fishing fleets.

The following are available from Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.:

General Studies on Fishing Industry, USSR, TT64-31853, 71 pp., illus., processed, July 24, 1964, \$3. (Translated from the Russian, *Rybnoe Khoziaistvo*, no. 4, 1964.)

"A possible method of controlling the food supply of fish in Taganrog Gulf in the Sea of Azov," by A. F. Gun'ko, article, *Translation of Doklady Biological Sciences Sections*, vol. 127, nos. 1-6, pp. 664-666, printed. (Translated from the Russian, *Doklady Akademii Nauk SSSR*, vol. 127, no. 4, 1959, pp. 900-902.)

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VENEZUELA:

Establishing a Business in Venezuela, by William Fröhlich, OBR 64-141, 20 pp., printed, Dec. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Rich economic resources, rapid economic and population growth, economic stability, strong currency, freedom to remit capital and profits abroad, and proximity to world markets are among the factors tending to attract investors to Venezuela. The report contains information on Venezuela's investment climate; legislation governing investment; organization of business; and patent, trademark, and copyright protection. Also discusses the employment situation, income and other taxes, availability of capital, basic economic facilities, and investment information services.

VESSELS:

Mechanization of Small Fishing Craft, edited by John Burgess, 112 pp., illus., printed, Arthur J. Heighway Publications Ltd., 110 Fleet St., London EC4, England. Much of the information in this book is based upon papers presented at a symposium on the mechanization of fishing craft held in Seoul, Korea, in 1962, and organized by the Food and Agriculture Organization of the United Nations and its Indo-Pacific Fisheries Council. Section 1, Installation and operation of outboard motors, with a foreword by D. B. Finn, includes articles on: "The impact of outboard mechanization of developing fisheries," by Jan-Olof Traung; "Development of mechanized fleets in Indo-Pacific fisheries," by K. Chidambaram; "Outboards in tropical fisheries," by John Burgess; and "Overcoming problems on boat design, servicing and fuel costs," by Jan-Olof Traung. Section 2, Inboard engines in open craft, presents articles on: "Phases in the transition to mechanized vessels," by P. Gurtner; "Design considerations. I; II"; "Open fishing craft with inboard engines," by Jan-Olof Traung; "Selection of marine engines under 50 h. p.," by E. Kvaran; and "Engine beds for small fishing boats," by Erik Estlander. Section 3, Inboard engines in decked craft, includes these articles: "Problems with small decked fishing craft," by Jan-Olof Traung; "Development in Hong Kong," by W. D. Orchard; "Transition in Japan and Korea," by S. Takayama and Z. G. Kim; and "Efficient propeller selection," by Jan-Olof Traung. Section 4, Problems of engine service and maintenance, contains these articles: "Seven conditions to ensure smooth running," by E. Kvaran; "Fuels and lubricants for small engines," by John Burgess; "Problems of servicing in less developed countries," by L. Stenstrom; and "Some parameters for plotting fishing craft power," by Jan-Olof Traung.

VIET-NAM:

"How to increase the catch of salt-water fish," by Hoang Xuan Hai, article, Selected Articles from Fishing Industry in North Viet Nam, JPNS 655-D, pp. 1-4, printed. (Translated from the Vietnamese, Nong Lam (North Viet Nam), no. 1, Jan. 1959, pp. 28-29.) Photoduplication Service, Library of Congress, Washington, D. C. 20540.

VITAMINS:

A Chemical Method for the Estimation of Vitamin D in Fish Oils, by I. N. Garkin and V. N. Bukin, 60-13713, 10 pp., processed, microfilm \$2.40, photostat \$3.30. (Translated from the Russian, *Biokhimiya*, vol. 16, no. 2, 1951, pp. 176-185.) Photoduplication Service, Library of Congress, Washington, D. C. 20540.

The following abstracts are from Chemical Abstracts; American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006:

"The molecular distillation of Vitamin A from the fats of marine animals," by S. I. Maksimov, vol. 59, Nov. 25, 1963, Abstract No. 13110c.

"Preparation of 'Ketone 250' from the Vitamin D of tunny fish liver," by Y. Raoul and N. Le Boulch, vol. 58, May 27, 1963, Abstract No. 11612f.

"Utilization of oils and fats from viscera of aquatic animals. V--Industrial adaptability of the esterification methods for concentrating Vitamin A," by Hiroshi Sone, vol. 60, April 27, 1964, Abstract No. 10479c.

WHALE MEAT:

"Preservation of whale meat for feeding purposes," by L. Shemi'kova and V. Kulyasova, article, *Rybnaya Promyshlennost Dal'nego Vostoka*, no. 1, 1963, p. 16, printed in Russian. *Rybnaya Promyshlennost Dal'nego Vostoka*, Vladivostok, U.S.S.R.

WHALES:

"Progress report on sperm whale research in the southeast Pacific Ocean," by Robert Clarke, Anelio Aguayo L., and Oble Paliza G., article, *Norsk Hvalfangst-Tidende* (The Norwegian Whaling Gazette), vol. 53, no. 11, Nov. 1964, pp. 297-302, illus., printed. Hvalfangerforeningen, Sandefjord, Norway.

The following reports, reprinted from *Tuatara*, vol. 12, no. 2, July 1964, are available from the Fisheries Laboratory, Marine Department, Wellington, New Zealand:

Recent Observations in New Zealand Waters on Some Aspects of Behaviour of the Sperm Whale (PHYSETER MACROCEPHALUS), by D. E. Gaskin, No. 66, pp. 106-114, illus., printed.

Return of the Southern Right Whale (EUBALEANA AUSTRALIS Desm.) to New Zealand Waters, 1963, by D. E. Gaskin, No. 67, pp. 115-118, illus., printed.

WHALING:

Australian Whaling, 1963, Catch Results and Research, by J. L. Bannister, Report 38, 34 pp., illus., processed, 1964. Marine Laboratory, Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Cronulla, Sydney, Australia. At Albany, Australia, the sperm whale catch per unit of effort during 1963 was less than in either of the two previous years. An analysis of results from the first 13 months of an aerial survey off the Western Australian coast shows that sperm whales are found farther offshore on the west coast while being concentrated near the continental shelf on the southwest coast. Provisional estimates of the density of sightings show a peak of abundance in Novem-

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ber. Catch and effort data for the small number of humpback whales caught during 1963 show that this species continued to decline. The catchable stock is estimated at 568 humpbacks, of which not more than 261 could be adult. No further catches of humpbacks are expected for some years because of the recent international agreement prohibiting their capture in the southern hemisphere. This report includes a number of statistical tables showing catch and effort, and lengths of sperm and humpback whales landed by Australian vessels, 1963.

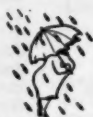
WHALING:

"Effects of various catch quotas," article, Norsk Hvalfangst-Tidende, vol. 53, no. 12, Dec. 1964, pp. 321-323, printed, Hvalfangerforeningen, Sandefjord, Norway.

WHITEFISH:

"Acclimatization of the whitefish (*Coregonus peled*) in small Karelian lakes," by Z. A. Gorbunova, article, *Problemy Ispol'zovaniya Promyslovyykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii*, vol. 1, 1963, pp. 181-186, printed in Russian, *Problemy Ispol'zovaniya Promyslovyykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii*, Akademiia Nauk SSSR, Moscow, U.S.S.R.

"Promyshlennoe vyrashchivanie molodi sigovykh ryb v Belorussii" (Commercial raising of young whitefish in Belorussia), by A. L. Shteinfel'd, article, *Referativnii Zhurnal-Biologiya*, 1963, Abstract No. 17159, printed in Russian, Akademiia Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.



CORRECTION

The December 1964 issue, page 157, showed that the report, Postwar Expansion of Russia's Fishing Industry, was available from the U. S. Government Printing Office. We now find that the report may be obtained only from the Committee on Commerce, United States Senate, Washington, D. C., and distribution is limited.



SUBJECT INDEXES FOR COMMERCIAL FISHERIES REVIEW

The subject index for Vol. 23 (1961) of Commercial Fisheries Review was issued and mailed to those on the mailing list for the Review. The index for Vol. 25 (1963) is in press.

Subject indexes for Vol. 19 (1957), Vol. 20 (1958), Vol. 21 (1959), Vol. 22 (1960), Vol. 24 (1962), and Vol. 26 (1964) have not been issued yet. We hope to issue indexes for those volumes in the near future.



GYRATIONS OF SPINNER PORPOISE FILMED AS AID TO MARINE-ANIMAL BEHAVIOR STUDIES



Film sequences showing spinning behavior of the porpoise.

Scientists of the U. S. Bureau of Commercial Fisheries' eastern Pacific tuna behavior program at La Jolla, Calif., have chalked up an interesting "first" in the field of marine-animal behavior--a documentary motion picture film of the spinning behavior of the spinner porpoise (*Stenella microps* Gray). This porpoise, or as some authorities prefer to call it, dolphin, was originally represented in the world's collections by a single skull from the Islas Tres Marias near the mouth of the Gulf of California, and was thought to be a rare species until Bureau scientists sent several specimens to the U. S. National Museum for identification. A description of the spinning jumps made by the porpoise was received with skepticism by several cetacean experts (although known to area fishermen), who were unaware of such behavior and thought it might be an optical illusion caused by a rotary motion of the tail.

The film was taken to substantiate observations made by the Bureau biologists. It was shown at the First International Symposium on Cetaceans held in Washington, D. C., in August 1963. As a result of that showing, requests for copies of the film have been received from several foreign scientists including a Dutch scientist in the Netherlands who is an international authority on cetaceans and author of the book *Whales*.

Two types of behavior are demonstrated in the film. The first is a combination of forward and upward motions necessary to bring the porpoise's blowhole clear of the water. As swimming speed increases, the amount of body exposed increases until, at moderate speeds, the entire animal is out of the water. The second type of jumping behavior differs from the first in that the angle at which the porpoise leaves the water is usually much greater, the duration of the jump is increased many times, and the animal rotates its body rapidly before it re-enters the water, head first. Often the animal does not clear the water completely and the spinning occurs with the tail submerged. This porpoise also may make several spinning jumps in succession, rotating in a clockwise or counterclockwise direction. The cause of that behavior is not known. Remoras or shark suckers frequently are seen attached to swimming porpoises and at first it was thought the spinning was an attempt to dislodge them; however, remoras are not attached to all spinning porpoises. Courtship display has been rejected as a possible cause since spinning has been observed in immature animals.

The spinner porpoise is often associated with schools of yellowfin tuna in the eastern Pacific Ocean. In one instance, a group of about 400 porpoises accompanied a school of tuna estimated at 200 tons. This association has led to a study on the behavior and ecology of porpoises in an effort to widen understanding of the yellowfin tuna resource, which is the mainstay of the United States Pacific tuna fleet.

ALASKAN QUAKE CAUSED HISTORY'S GREATEST UPLIFT

The Good Friday (March 1964) earthquake in Alaska was so strong that it caused the greatest uplift of land ever recorded in history, a rise of more than 50 feet in the ocean floor of the Gulf of Alaska, the Director of the Coast and Geodetic Survey (C&GS), U. S. Department of Commerce, announced November 20, 1964.



A hydrographic survey completed during the summer 1964 by the Coast and Geodetic ship Surveyor disclosed that a large area of the sea floor was uplifted in excess of 30 feet, with a maximum rise of more than 50 feet in three areas. This was determined by comparison with a similar C&GS survey in 1927.

The sharp rise in the ocean floor took place in the area between Kodiak and Montague Islands, not far from Prince William Sound, where the March 27 earthquake was centered. The disaster killed 114 persons and caused an estimated \$750 million in damage.

The uplift in the ocean floor resulting from the earthquake was considerably greater than the maximum rise of 31.5 feet previously reported for Cape Cleare, Montague Island. The greatest uplift in history previously reported was 47½ feet at Bancas Point in Disenchantment Bay, Alaska, following the 1899 Yakutat Bay quake.

Still other studies conducted by the C&GS following the March 27 earthquake revealed:

1. That the earth shifted horizontally 15 to 20 feet between Montague Island and La-touche Island, according to a survey made by the C&GS ship Hodgson. Comparison with observations made in 1933 by the scientific agency revealed that the distance between fixed points on the two islands decreased by 15 to 20 feet as a result of the quake.

2. That along a valley on the Kenai Peninsula the mountains moved an average of five feet. This was ascertained by triangulation parties, which determine horizontal positions on the earth.

Leveling parties of the Coast and Geodetic Survey also checked vertical displacement of the earth in the same region. They found that the earthquake caused the earth to drop in the 400-mile area between Valdez and Seward. The subsidence ranged from 3.2 feet at Seward to 5.6 feet at Portage.

FISH MAKES MAJOR CONTRIBUTION TO NEW YORK CITY'S "ANTI-CORONARY CLUB" DIET

New York City's "Anti-Coronary Club" since 1957 has had as its objective the development of a practical, safe, and effective dietary approach to the prevention of coronary heart disease affecting western civilization, according to Dr. George Christakis, Director of Nutrition, New York City Board of Health. What follows is in part an address given by the Director to the Newspaper Food Editors Conference, New York City, October 5, 1964. The meeting was sponsored by the Fish'n Seafood Promotions Division of the National Fisheries Institute.

The New York City Health Department center on the east side of mid-town Manhattan is where the members of the "club" are interviewed, given an orientation lecture, then weighed and given a very complete physical examination, including laboratory tests, X-rays, and electrocardiograms. They are given an intense dietary instruction by the Bureau of Nutrition's public health nutritionists; their progress is then monitored by a panel of physicians every 5 weeks, at which time a serum cholesterol level is taken.

The cast of characters in this drama of human experimentation are 1,200 men, New Yorkers ranging in age from 40 to 59 and mostly in managerial and professional occupations. Approximately 800 of the men selflessly attend the "Anti-Coronary Club" during working hours and voluntarily disavow their usual diet habits in order to embark on a new nutritional way of life. With a twinkle of optimism, this new way of eating was nicknamed "The Prudent Diet." The remaining 400 men in the project are under observation while keeping to their usual diet habits; they serve as the "Anti-Coronary Club's" control group.

The important events in the scientific world which set the scene for the advent of the "Anti-Coronary Club" were:

1. The recognition that coronary heart disease is the number one killer of men in the United States.
2. Scientists studying the relationship between diet and coronary heart disease in many areas of the world found that the amount of coronary heart disease and the level of serum cholesterol of a population went hand-in-hand. The higher the level of cholesterol, the higher the death-rate from coronary heart disease; the lower the level of cholesterol the lower the heart attack death rate was in that population.
3. The discovery that the amount and type of fat in the diet could strongly influence the level of serum cholesterol. The more saturated fat in the diet, the higher the serum cholesterol level tended to rise; the less saturated fat, or the more polyunsaturated fat in the diet, the lower the serum cholesterol level dropped. Thus, saturated and polyunsaturated fats were found to have opposite effects on the serum cholesterol level.
4. The breakthrough by the U. S. Public Health Service-sponsored Framingham Study which identified the high serum cholesterol level as a major risk factor associated with coronary heart disease as this disease developed in Framingham, Mass., townspeople.

Against this back-drop of scientific advances, the ultimate task of the "Anti-Coronary Club" was to test the idea that a diet relatively low in saturated fat and high in polyunsaturated fat could lower serum cholesterol and thereby perhaps prevent coronary heart disease.

What is the "Anti-Coronary Club's" diet? The diet is a varied one with beef, fish, poultry, and veal prominently featured on the menu plan. Saturated fat intake is decreased by an avoidance of more than 16 ounces of beef, mutton, or pork per week. Butter, ice cream, and hard cheeses are replaced respectively by margarines rich in polyunsaturated fat, sherbets, and cheeses low in saturated fats. Rich desserts and pastries made with hydrogenated shortening are replaced by baked goods low in saturated fat content and made with polyunsaturated shortenings.

(Continued on next page)

A major contribution to the diet is made by fish, as fish are rich sources of polyunsaturated fats. At least 5 meals per week contain fish or other sea foods. Beef may be consumed 4 meals per week, and the remaining meals are comprised of poultry and veal. Vegetables and fruits also share a prominent place in the diet pattern. Cereals, vegetable oil, and nuts are also included. Eggs are limited to 4 per week.

The principles upon which the diet is based are two: (1) moderation in quantity of dietary fat; (2) balance of the types of fat.

The diet lowers the total number of daily calories derived from fat from about 42 percent as is present in the usual American diet, to 32 percent. It furthermore aims to balance the amounts of the three types of fat found in most foods. About two-thirds of the fat usually consumed is saturated. In the Prudent Diet this is reduced to one-third. Thus there are approximately equal numbers of calories contributed by the three types of fat: saturated, mono-unsaturated, and polyunsaturated. Saturated fats are mostly found in beef and dairy products. Mono-unsaturated fats are present in olive oil and margarine. Polyunsaturated fats are mostly found in fish, vegetable oils, and certain nuts...

What are the results of the "Anti-Coronary Club" to date? It has been demonstrated that members find the study diet palatable and acceptable enough to contrive consuming it for more than seven years. Moreover the diet has been effective in lowering serum cholesterol and keeping it low over an extended period of time.

In order to assess the nutritional adequacy of the diet in relation to vitamins A and E, recent investigations have affirmed normal serum levels of these vitamins in a sample of Anti-Coronary members. The effect of the study diet on serum triglyceride levels was also measured since this blood fat factor may also be related to coronary heart disease incidence. While the diet lowered cholesterol, it was found not to raise the triglyceride level.

Another research problem which faced us at the "Anti-Coronary Club" was finding a way to prove that the Club's members were actually consuming the foods they were taught to eat, and which they said they ate. We found that by taking a sample of their fat tissue and analyzing it chemically for individual fatty acids, we could trace the actual changes in composition of their own fat as they continued to consume the polyunsaturated fatty acids predominantly found in fish. Thus, at least as certain fish fats are concerned, "man is what he eats."

Observations suggest that the members of the "Club" appear to be having fewer heart attacks than would be expected.

But why does 30 to 40 percent of our adult male population have levels of serum cholesterol high enough to increase their risk of developing coronary heart disease? Why do our young men have rapidly rising levels of serum cholesterol from age 18 to 27? Might not these high levels of serum cholesterol reflect overintake of foods containing saturated fats, or underconsumption of foods rich in polyunsaturated fats? Or both? Other factors may also contribute to the high levels of serum cholesterol observed in American men, such as lack of exercise and psychological stress. However, the importance of diet in influencing the serum cholesterol level is so well documented as to urge that we take a critical look at how we, as a people, are eating. There is no nation that can surpass the advances being made by our food technologists. Nor any land that is blessed by a more bountiful national harvest. Much knowledge supplied by the nutrition sciences has already been incorporated in the American diet; this must not be violated. But the virtues of our present diet pattern should not be extolled so loudly that it is considered insusceptible to improvement.

Nutritional abundance should not be mistaken for nutritional excellence. Though faced with thousands of different food items in the supermarket which compete for her attention, the housewife must prudently choose the foods that will comprise a truly balanced diet. These include meats, fish, dairy products, vegetables, fruits, cereals, and oils. No food group, or groups, should be overconsumed to the exclusion of others. The housewife also has the responsibility of preparing these foods so attractively and deliciously that all food groups will meet with enthusiastic acceptance...

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